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ABSTRACT

Contained in this document are the hearings held before the select subcommittee on education of the Committee on Education and Labor, House of Representatives, ninety-first Congress, leading to the establishment of the Environmental Quality Education Act of 1970. The bill, H.R. 14753, authorizes the United States Commissioner of Education to establish educational programs to encourage understanding of policies and support of activities designed to enhance environmental quality and maintain ecological balance. In addition, the purpose of the act is to demonstrate the use of new and improved curriculums in model educational programs and to evaluate the effectiveness thereof; to disseminate curricular materials and information for use in educational programs throughout the Nation; to provide training programs for teachers, other educational personnel, public service personnel, and community and industrial business leaders and employees and government employees at State, Federal, and local levels; and to provide for community education programs on preserving and enhancing environmental quality and maintaining ecological balance. Statements, letters, and supplemental material from more than 120 people were presented to the subcommittee chaired by John Brademas, Indiana. (BL)

ENVIRONMENTAL QUALITY EDUCATION ACT OF 1970

ED049918

HEARINGS

BEFORE THE

SELECT SUBCOMMITTEE ON EDUCATION

OF THE

COMMITTEE ON EDUCATION AND LABOR
HOUSE OF REPRESENTATIVES

NINETY-FIRST CONGRESS

SECOND SESSION

ON

H.R. 14753

A BILL TO AUTHORIZE THE UNITED STATES COMMISSIONER OF EDUCATION TO ESTABLISH EDUCATIONAL PROGRAMS TO ENCOURAGE UNDERSTANDING OF POLICIES AND SUPPORT OF ACTIVITIES DESIGNED TO ENHANCE ENVIRONMENTAL QUALITY AND MAINTAIN ECOLOGICAL BALANCE

HEARINGS HELD IN WASHINGTON, D.C., MARCH 24, 25, 26; APRIL 7, 8, 9, 10, 15, AND 21, 1970; NEW YORK, N.Y., APRIL 11 AND 24, 1970; SAN FRANCISCO, CALIF., MAY 1, 1970; LOS ANGELES, CALIF., MAY 2, 1970

Printed for the use of the Committee on Education and Labor
CARL D. PERKINS, *Chairman*

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ENVIRONMENTAL QUALITY EDUCATION ACT

TUESDAY, MARCH 24, 1970

House of Representatives,
Select Subcommittee on Education
of the Committee on Education and Labor,
Washington, D.C.

The subcommittee met at 9:30 a.m., pursuant to call, in room 2261, Rayburn House Office Building, Hon. John Brademas (chairman of the subcommittee) presiding.

Present: Representatives Brademas, Scheuer, and Hansen of Idaho.

Staff members present: Jack G. Duncan, counsel; Ronald C. Katz, assistant staff director; Arlene Horowitz, staff assistant; Toni Immerman, clerk; Maureen Orth, consultant; Marty LaVor, minority legislative coordinator.

(Text of H.R. 14753 follows:)

[H.R. 14753, 91st Cong., first sess.]

A BILL To authorize the United States Commissioner of Education to establish educational programs to encourage understanding of policies and support of activities designed to enhance environmental quality and maintain ecological balance

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That this Act may be cited as the "Environmental Quality Education Act".

STATEMENTS OF FINDINGS AND PURPOSE

Sec. 2. (a) The Congress of the United States finds that the deterioration of the quality of the Nation's environment and of its ecological balance is in part due to poor understanding by citizens of the Nation's environment and of the need for ecological balance; that presently there do not exist adequate resources for educating citizens in these areas, and that concerted efforts in educating citizens about environmental quality and ecological balance are therefore necessary.

(b) It is the purpose of this Act to encourage and support the development of new and improved curriculums to encourage understanding of policies, and support of activities designed to enhance environmental quality and maintain ecological balance; to demonstrate the use of such curriculums in model educational programs and to evaluate the effectiveness thereof; to disseminate curricular materials and information for use in educational programs throughout the Nation; to provide training programs for teachers, other educational personnel, public service personnel, and community and industrial business leaders and employees, and government employees at State, Federal, and local levels; to provide for community education programs on preserving and enhancing environmental quality and maintaining ecological balance.

USES OF FUNDS

Sec. 3. (a) From the sums appropriated, the United States Commissioner of Education, hereinafter referred to in this Act as the "Commissioner", shall assist in educating the public on the problems of environmental quality and ecological balance by:

(1) Making grants to or entering into contracts with institutions of higher education and other public or private agencies, institutions, or organizations for:

(a) Projects for the development of curriculums to encourage preserving and enhancing environmental quality and maintaining ecological balance.

(b) Pilot projects designed to demonstrate and test the effectiveness of the curriculums described in clause (a) whether developed with assistance under this Act or otherwise.

(c) In the case of applicants who have conducted pilot projects under clause (b), projects for the dissemination of curricular materials and other information regarding the environment and ecology.

(2) Undertaking directly or through contract or other arrangements with institutions of higher education or other public or private agencies, institutions, or organizations evaluations of the effectiveness of curriculums tested in use in elementary, secondary, college, and adult education programs involved in pilot projects described in paragraph 1(b).

(3) Making grants to institutions of higher education, local educational agencies, and other public or private organizations to provide preservice and inservice training programs on environmental quality and ecology (including courses of study, symposiums, and workshops, institutes, seminars, conferences) for teachers, other educational personnel, public service personnel, and community, business and industrial leaders and employees, and government employees at State, Federal, and local levels.

(4) Making grants to local education, municipal, and State agencies and other public and private nonprofit organnizations for community education on environmental quality and ecology, especially for adults.

(5) Making grants for preparation and distribution of materials suitable for use by mass media in dealing with the environment and ecology.

APPROVAL OF APPLICATIONS

SEC. 4. (a) Financial assistance for a project under this Act may be made only upon application at such time or times, in such manner, and containing or accompanied by such information as the Commissioner deems necessary, and only if such application—

(1) provides that the activities and services for which assistance under this title is sought will be administered by or under the supervision of the applicant;

(2) sets forth a program for carrying out the purposes set forth in section 3 and provides for such methods of administration as are necessary for the proper and efficient operation of such programs;

(3) sets forth policies and procedures which assure that Federal funds made available under this Act for any fiscal year will be so used as to supplement and, to the extent practical, increase the level of funds that would, in the absence of such Federal funds, be made available by the applicant for the purposes described in section 3, and in no case supplant such funds.

(4) provides for such fiscal control and fund accounting procedures as may be necessary to assure proper disbursement of and accounting for Federal funds paid to the applicant under this title; and

(5) provides for making an annual report and such other reports, in such form and containing such information, as the Commissioner may reasonably require and for keeping such records, and for affording such access thereto as the Commissioner may find necessary to assure the correctness and verification of such reports.

(b) Applications from local educational agencies for financial assistance under this Act may be approved by the Commissioner only if the State educational agency has been notified of the application and been given the opportunity to offer recommendations.

(c) Amendments of applications shall, except as the Commissioner may otherwise provide by or pursuant to regulation, be subject to approval in the same manner as original applications.

ADVISORY COMMITTEE ON ENVIRONMENTAL QUALITY EDUCATION

SEC. 5. (a) The Secretary of Health, Education, and Welfare shall appoint an Advisory Committee on Environmental Quality Education which shall—

(1) advise the Secretary concerning the administration of, preparation of,

general regulations for, and operation of, programs supported with assistance under this Act;

(2) make recommendations regarding the allocation of the funds under this Act among the various purposes set forth in section 3 and the criteria for establishing priorities in deciding which applications to approve, including criteria designed to achieve an appropriate geographical distributon of approved projects throughout all regions of the Nation;

(3) review applications and make recommendations thereon;

(4) review the administration and operation of projects and programs under this Act, including the effectiveness of such projects and programs in meeting the purposes for which they are established and operated, make recommendations with respect thereto, and make annual reports of its findings and recommendations (including recommendations for improvements in this Act) to the Secretary for transmittal to the Congress; and

(5) evaluate programs and projects carried out under this Act and disseminate the results of such evaluations.

(b) The Advisory Committee on Environmental Quality Education shall be appointed by the Secretary without regard to the civil service laws and shall consist of twenty-one members. The Secretary shall appoint one member as Chairman. The Committee shall consist of persons familiar with education, information media, and the relationship of man as producer, consumer, and citizen to his environment and the Nation's ecology. The Committee shall meet at the call of the Chairman or of the Secretary.

(c) Members of the Advisory Committee shall, while serving on the business of the Advisory Committee, be entitled to receive compensation at rates fixed by the Secretary, but not exceeding $100 per day, including travel time; and while so serving away from their homes or regular places of business, they may be allowed travel expenses, including per diem in lieu of subsistence, as authorized by section 5703 of title 5 of the United States Code for persons in the Government service employed intermittently

TECHNICAL ASSISTANCE

SEC. 6. The Secretary, in cooperation with other Cabinet officers with relevant jurisdiction, shall, upon request, render technical assistance to local educational agencies, public and private nonprofit organizations, private profitmaking organizations, institutions of higher learning, agencies of local, State, and Federal Government and other agencies deemed by the Secretary to play a role in preserving and enhancing environmental quality and maintaining ecological balance. The technical assistance shall be designed to enable the recipient agency to carry on education programs which (1) deal with environmental quality and ecology and (2) deal with environmental and ecological problems pertinent to the recipient agency.

PAYMENTS

SEC. 7. Payments under this Act may be made in installments and in advance or by way of reimbursement, with necessary adjustments on account of overpayments or underpayments.

ADMINISTRATION

SEC. 8. In administering the provisions of this Act, the Secretary is authorized to utilize the services and facilities of any agency of the Federal Government and of any other public or private agency or institution in accordance with appropriate agreements, and to pay for such services either in advance or by way of reimbursement, as may be agreed upon.

AUTHORIZATION

SEC. 9. There is authorized to be appropriated for the fiscal year ending June 30, 1970, for carrying out the purposes of this Act such sums as Congress may deem necessary.

Mr. BRADEMAS. The subcommittee will come to order.

The Select Subcommittee on Education today opens the hearings on H.R. 14753, the Environmental Quality Education Act, which, on November 12, 1969, I introduced along with the gentlemen from New

York, Mr. Scheuer and Mr. Reid, and the gentleman from Idaho, Mr. Hansen. The bill now enjoys the cosponsorship of some 80 Members of the House of Representatives of both parties.

Members of Congress, I am sure, must all be struck with the really phenomenal growth and awareness in our own country and others of the dangers of the quality of our environment. I cite only a few examples:

First, the recent issues of major national magazines such as Forum, Time, Life, Newsweek have been devoted primarily to ecological questions. Second, legal actions have recently been filed by the attorney general of Illinois against major corporations which have been dumping pollutants in waters around Chicago. Further, only last week the Department of Justice obtained a grand jury indictment against United States Steel for dumping solid wastes into Lake Michigan.

Third, there has been an extraordinary growth of ecology action groups among students on college campuses. Thousands of students at colleges and high schools all over the country are scheduled to participate in a nationwide environmental teach-in on April 22 which is designed to alert citizens of the nature of our environment. You may recall that the opening teach-in took place last week at the University of Michigan at Ann Arbor.

Fourth, President Nixon's message of February 11, 1970, on environment, in which the President calls for expenditure of $4 billion in Federal funds over the next 5 years on, among other items, uniform Federal standards for water purity, treatments plants, and development of pollution-free automobiles.

The signs of environmental decay are obvious everywhere.

Oil from faulty drillings fouls our beaches and endangers marine life and waterfowl.

Pollution of the air takes minutes from each of our lives.

Human and industrial waste soils our streams and rivers.

Poisonous pesticides and fertilizers contaminate our food.

Messy industrial areas, unsightly junkyards, ugly billboards, and thickets of powerlines diminish the joy of what we would otherwise see.

To clean up our environment and to restore it to a congenial state will require billions of dollars in Federal funds and money from other sources as well, public and private.

But in the view of the sponsors of the bill under consideration today, to achieve this goal we will also need a major educational effort to acquaint our younger students and adult citizens with the ecological facts of life so that future generations will not be faced with the problems that we are only beginning to confront now.

I might note here the following statement from the report which the Citizens Advisory Committee on Environmental Quality made to the President in August 1969:

> Man's interaction with his environment, both natural and man-produced, is the basis of all learning—the very origin and substance of education. Yet, our formal education system has done little to produce an informed citizenry, sensitive to environmental problems and prepared and motivated to work toward their solution.

The bill we are today considering is directed to the task of making Americans more aware of the dangers to their environment and to the steps we must take to meet them.

Briefly, the Environmental Quality Education Act provides funds for:

First, aid to colleges and universities to develop materials for teaching environmental studies, natural resources, pollution control, and conservation.

Second, support for training teachers of environmental studies.

Third, grants for elementary and secondary schools and universities to teach ecology courses.

Fourth, funds for community conferences on the environment for civic and industrial leaders and State and local government officials.

Fifth, grants for preparing materials on the environment for use by mass media.

During the course of the hearings, the subcommittee plans to visit several areas of the country and to hear testimony from a broad spectrum of interested witnesses, including ecologists, students, environmental educators, industrial leaders, labor leaders, conservation groups and citizens' organizations.

Today our witnesses will include a prominent ecologist, Dr. LaMont Cole, professor of ecology at Cornell University; two outstanding American painters, Robert Motherwell and Helen Frankenthaler; and Dr. Joseph Sittler, outstanding Lutheran theologian from the University of Chicago.

On Wednesday, March 25, we will receive testimony from a group of students who are planning the April 22 environmental teach-in; Garrett de Bell, editor of the Environmental Handbook; and William Knowland, a student at Antioch College.

On Thursday, March 26, we will hear from Dr. Matthew Brennan, the director of the Pinchot Institute: Dr. Edward Weidner, chancellor of the University of Wisconsin at Green Bay; and Dr. Clarence Schoenfeld, chairman of the Center for Environmental Education at the University of Wisconsin at Madison.

Among witnesses scheduled for later hearings are Margaret Mead, noted anthropologist; David Gates and John Cantlan, ecologists; and Dr. James E. Allen, Assistant Secretary of Health, Education, and Welfare for Education and U.S. Commissioner of Education; Mr. John Macy, president of the Corporation for Public Broadcasting; John F. Steinhardt, coauthor of the recent report on the President's Environmental Quality concerning the role of universities in environmental education and from other witnesses.

We are very pleased to welcome as our opening witness on this legislation Dr. LaMont Cole, professor of ecology at Cornell University.

Dr. Cole, would you please come forward, and we look forward to hearing from you, sir.

STATEMENT OF LaMONT COLE, PROFESSOR OF ECOLOGY, CORNELL UNIVERSITY

Mr. Cole. I thank you, Mr. Chairman. I am sorry it was impossible for me to put together a prepared statement to hand out. I have been going pretty steadily from one teach-in to another. I have been traveling a great deal.

You asked about biographical material. Do you want me to talk about myself or should I get into the statement?

Mr. **Brademas.** I think it would be helpful if you would give us just a few brief comments on your background for edification of the members.

Mr. **Cole.** I received a bachelor's degree in physics in 1938 at the University of Chicago and a master's degree in biology in 1940 at the University of Utah, Ph. D. in zoology at the University of Chicago in 1944, and last summer the University of Vermont awarded me an Sc. D.

I have been at Cornell since the fall of 1948, teaching ecology. I served on numerous committees of the Ecological Society and numerous advisory committees to various Government agencies—ONR, NIH, NSF, and so forth. I served 5 years on the Advisory Committee for Environmental Biology of NSF. I served for 5 years as editor of *Ecology* and 2 years ago I was president of the Ecological Society of America, and I just retired in January as president of the American Institute of Biological Sciences.

I am now serving on the American Biology Council, which is an eight-man group put together by the two largest groups of professional biologists in an attempt to have a body that can speak with one voice for all biologists.

Mr. **Brademas.** You have a splendid background, and clearly we picked the right man to open these hearings.

Mr. **Cole.** Well, in your letter, you also said that there was hope I could give the principles of ecology, while keeping my total statement down to around 15 minutes. Now, this is a pretty large order, but I think to pick out one distinctive thing about ecology is the point of view that we try to take a holistic approach to problems, to realize that the plants, animals, micro-organisms, and nonliving features of the environment all form one integrated system, and when you impinge, put a pressure on this system, all of these things are changed.

For example, the average engineer looks on a salt marsh as a piece of wasteland, a nice place to build jet strips or resort hotels or something of the sort. A good many citizens look at the salt marsh as a nuisance, a rearing place for mosquitoes that ought to be bathed with pesticides.

The ecologist recognizes that salt marshes are highly productive of life. In Georgia we have actual figures showing they are three or four times as productive as the best agricultural land in the State. The organic matter produced is the source of nutrients for the coastal regions and estuaries serving as spawning grounds for most of the marine commercial and sport fish and which serve as nurseries for our oysters and crabs and lobsters and shrimp.

So when you put a new stress on a salt marsh, you are endangering, making changes in, the whole marine seafood industry. This system ought to be looked at as a whole so that you can predict the so-called side effects before you apply your technology and then see these strange things happen.

Now, I could give you a great many more examples. We have had numerous examples where pesticides were used to control a pest and instead made the pest more abundant because the pesticides knocked out its natural enemies.

We have many other cases where pesticides had been used to control a pest and had succeeded in doing so, only to have some other species emerge as a pest. So, frequently we have created new pest species by some of these control measures.

Now the public is becoming aware of these things; people are concerned, and they are asking the ecologists for advice on these things, and a lot of rather strange people are beginning to call themselves "ecologists," I might add. There are not enough ecologists to go around. We have anticipated this for some time. We knew that the public would discover us someday and want ecological advice and there would be the embarrassment of not having enough trained people.

Several years ago in the Ecological Society we did a survey of the manpower situation. The National Registry of Scientific and Technical Personnel lists 1,354 persons who class themselves as primarily ecologists. This is an underestimate, I would guess, by as much as 50 percent of the true number, because many people that we recognize as ecologists and that were active in the Ecological Society would list their first specialty as oceanography or limnology or something of that sort even though they might be, in a sense, in a branch of ecology.

Mr. Brademas. What is the second of those?

Mr. Cole. Limnology, the study of fresh water.

We sent a questionnaire around to a large number of schools that are actively training ecologists to find out how many people they were training, and here we used a very broad definition of "an ecologist" as somebody that would be qualified to collaborate on ecological research even though not qualified to teach ecology per se.

This questionnaire showed that at that time there were 2,572 students of ecology training for the Ph. D. in the United States. So if about a quarter of these represent final-year Ph. D. students, our estimate is that from 600 to 700 new professional ecologists are being produced each year.

This is not nearly adequate. My desk is covered with letters wanting recommendations for people as new schools start programs. I could easily place 15 Ph. D.'s a year if I could train them. There are not enough places training ecologists. The applications are coming into schools that are known. We are simply swamped and we probably have as many as 50 applications for every student we can admit. A similar situation exists at Yale, and I suppose it is quite common in the schools that are better known as producers of ecologists.

So there are many jobs going begging and sometimes getting filled by people who are only peripherally ecological. There is even a letter on my desk from a far-sighted community on Long Island that wishes to hire a municipal ecologist. So we are seeing new trends in interests of this sort.

Mr. Brademas. Do I take it, then, Dr. Cole, you would be sympathetic to the recommendation contained in the report to the President's Environmental Quality Council in September, last year on the Universities and Environmental Quality which proposes establishment of some 20 new schools of ecology at American universities?

Mr. Cole. Absolutely. It is badly needed, and the difficulty is going to be in staffing them. Anything like this present bill that calls for increasing education in ecology has my enthusiastic support. I think it is highly essential.

I would like to say, though, there is one thing about this report that alarms me a bit. This occurs over on pages 6 and 7 in connection with the Advisory Committee, and particularly on page 7, lines 11 through

14, where it defines types of persons that are to serve. It says: It shall consist of persons familiar with education, information media, and the relationship of man as producer-consumer-citizen to its environment and the Nation's ecology.

The reason for concern about this is that so many people are now starting to call themselves "ecologists." I doubt that you realize how far this has gone. For example, at Cornell, the College of Home Economics recently changed its name to College of Human Ecology because this is now a good word.

Mr. **Scheuer.** There ought to be a law against that sort of thing.

Mr. **Cole.** It is already causing confusion in our graduate school applications. Last week I received a letter from a man with a Ph. D. in physics who decided he wanted to come back to school and get a degree in ecology. This had been referred over to some home economist and got shifted from there to somebody in the engineering school, and I think it was about the fourth bounce that it finally reached an authentic ecologist. This is going to continue. A lot of people are going to get in on this and call themselves "ecologists" without really being qualified.

Mr. **Brademas.** How would you define this—I don't want to interrupt you now unless you don't object, because maybe you would like to finish the whole statement and then let us question you?

Mr. **Cole.** Yes; why don't I do that. We anticipated this thing, and I wrote on July 17, 1968, a letter to Congressman Emilio Daddario in connection with the joint House-Senate colloquium to discuss national policy for the environment. The letter is published, but, if I may, I would like to read the last paragraphs, which summarize nicely some of the things I want to say (reading):

> I think the fact that this colloquium has been organized indicates growing awareness on the part of Congress that they do need competent advice on ecological questions. I have read most if not all of the bills calling for establishment of some sort of council of ecological advisers. I think the need for such a council is urgent, but I am disturbed by the present bills which fail to specify the range of competencies which should be represented. I shall mention here only two areas that are not well represented in the places that Congress traditionally turns to for scientific advice:
>
> First, underlining all of the problems of environmental deterioration is the problem of population growth. If the population is going to continue to grow indefinitely, the environment will continue to deteriorate and the ability to support life will eventually be destroyed. If the capacity to generate electricity by means that are feasible today continues to grow, we shall be finding ourselves writing off one body of water after another until none remains and we shall change our climate through thermal pollution of the atmosphere. Without population regulation, disaster is inevitable; therefore, I think it should be spelled out that any council of advisers on environmental problems must include demographic competence of the highest order.

The second area I wish to mention is ecology itself. Ecologists have become fairly accustomed to seeing one committee after another set up to deal with ecological problems without including a single ecologist. Many of the traditional scientific organizations are so ignorant in the field that it never occurs to them that ecologists might know something not immediately apparent to the chemist or engineer.

In parentheses it says: "I know of one recent case of an engineering dean who says it is now necessary to invent a new field to be known as environmental biology," so I would be sure to have it include ecologists of the highest competence.

Any such council will also need competence in chemistry, engineering, geology, meteorology, sociology, and economics. While a few rare individuals can be found who are competent in two or three of the areas mentioned, it seems to me certain that the three-man council envisioned by at least one of the bills is too small.

Somewhat later in the bill to establish this council on environmental quality, Representative John Dingell asked for my advice on this, and I wrote to him on August 1, 1969, and I will read one paragraph (reading):

> Several things about the composition of the proposed council disturbed me. First, consider the size; whether three, five, seven, or some other number, it should have topnotch ecology represented possibly by two ecologists, because few can claim top competence in plant ecology, animal, marine ecology, limnology, soils, and so on.

Then I told him much the same things I told Mr. Daddario. I will mention here one thing I think that needs saying.

The President's Scientific Advisory Council has never had an ecologist on it. They have a 16-man part-time panel of advisers on the environment, and only one of those 16 men, to my knowledge, can be said to have any knowledge of ecology.

The President, of course, set up this Environmental Quality Council, a Cabinet body, and it, of course, includes no ecologists, but they have a council of advisers, Citizens Advisory Committee of 12 men, with no ecologist.

So this is the sort of thing that we can anticipate going on indefinitely. They just don't know who the ecologists are.

When Mr. Dingell's bill finally went through and became law, the result was that we now have a three-man Council on Environmental Quality, including no ecologist.

Now, I don't want this to be interpreted as in any way criticizing the three distinguished gentlemen appointed to that Council, but it impresses me as a little bit like setting up a council of economic advisers without including any economist.

I am afraid that large segments of both Government and industry still view the problems of environmental deterioration as in large part a public relations problem. The newspapers just recently announced that DuPont has set up an environmental quality committee chaired by a vice president and it consists of one man each from their engineering department, legal department, and their public relations department.

Now, I think, as far as formal statements go, that that is all I will try to say. I would be very happy to try to answer any questions.

Mr. BRADEMAS. Thank you very much, Dr. Cole. I have a lot of questions for you. Let me begin by reiterating the question I put to you a moment ago with respect to which you did provide some response, but if you were asked to give a definition of "ecology," what would it be?

Mr. COLE. Well, "ecology" is formally defined as the study of the relationships or interrelationships among living things and their environments. So people that have had formal training in any part of this general broad area I would say might be considered as ecologists. It is very much a point of view.

Mr. Brademas. So a man could be, like you, a physicist but, because of the particular perspective he takes to the subject matter in the relationship of living things, could be defined as an ecologist?

Mr. Cole. Yes. David Gates, who will testify later, was trained as a physicist initially, and certainly the ecologists accept him as one of their own now.

Mr. Brademas. Why would you imagine there is no ecologist who is a member of the Citizens Advisory Committee to the President's Environmental Quality Council?

Mr. Cole. I have no idea whatsoever. It must be that they don't recognize the need for one.

Mr. Brademas. I would hope that it would not be the same reason you have suggested—a number of industries are now beginning to have their vice presidents for public relations take over that particular assignment.

Mr. Cole. I hope not, too; but I just don't know.

Mr. Brademas. Dr. Cole, *Time* magazine a few weeks ago described you as a charter member of the doomsday school of ecologists and then went on to say that despite your old pessimism, you have been somewhat encouraged over the last several years. Could you tell us why they called you that, and, second, if that was not inaccurate, what has lightened the burden on your spirit at this point in time?

Mr. Cole. Well, the course we are on is going to destroy the ability of the earth to support life. We are on a collision course with disaster in many ways. But I have been screaming with agony about it for 21 years. My first disspirited publication on the population problem was written 21 years ago, so the thing that has me encouraged now is the tremendous upsurge of interest in the subject.

Even 5 or 6 years ago, when we started sending little delegations around from the ecological society to talk to Members of Congress individually, we found they were very friendly and everything but they mostly listened just politely. Now they are calling up to see if I won't testify at this or that hearing, they are asking for statements on this and that, and they are requesting my advice on bills, even help on the wording of some of them and so forth.

The few of us that the public does recognize are simply swamped; I can't even get my mail open a good share of the time, much less read and answer it.

Mr. Brademas. You will appreciate that the principal thrust of the bill before us is to provide support for the establishment of environmental studies in our elementary and secondary schools in our universities and in community conferences, although the bill is not confined to those purposes.

But I wonder if you could, sir, give us a comment on those aspects of the bill that provide for grants to colleges and universities who develop curricular materials for teaching environmental studies in elementary and secondary schools and universities and, second, for the training of teachers to offer such courses in schools and, third, the question of direct support to elementary and secondary schools to offer environmental studies.

Mr. Cole. Well, I have felt for some time it is very necessary to get down at least into the secondary schools and it would probably be better if we could get into the elementary schools. They have to be informed in some way, and I have been approached by, I don't know how many publishers, to see about writing books at this level. The publishers are becoming aware that they want books on ecology at these levels now, and I expect in a few years you will see a flood of them coming out.

I think, from what I know of the public schools and the troubles that they are in, I think it is a very good thing to provide direct support for programs of this sort, which I hope would reach all of the students.

The training of the teachers to teach these students is going to be a serious thing, and I certainly favor the aspects of the bill that would provide for producing these teachers.

What we should be doing even at university levels now is training the ecologist teachers for the next generation, because we are trying to set up a national instiute of ecology, and if it comes to pass, it is likely to hurt the universities. There are not enough top people and some of them are going to have to be recruited to staff that agency which I feel is so sorely needed we must do it, but it may be at the universities' expense.

Mr. Brademas. Can you tell us what you have in mind? I believe you made the proposal in 1968 before the Committee on Science and Astronautics of the House. Can you tell us just what you contemplate with your proposed national institute of ecology and what the present status of that proposal is?

Mr. Cole. The Ecological Society of America, through its ecology study committee, which is the long-range planning arm of the society, has simply taken the initiative in pushing this thing, although we realize it has to involve a lot of people that won't find the proper home in the Ecological Society. It has to involve economists and geologists and a variety of other types of people.

So we carried our plans for it as far as we felt that we, as ecologists, could go. We visualize a coordinating body of big research projects, one that will undertake to do projects that are so big that no one institution can handle it, things comparable to some of the programs going on now under the international biological program. We contemplate a data storage and retrieval center.

You might be surprised to see the number of requests that we get. People call me up long distance, people I never heard of, and they say that the Department of Agriculture wants to spray their land for this or that, and the chemical they are going to use is this or that—"Is that good or bad?" And I am geting this sort of thing all the time. There should be a place I can go and have a computer quickly give me information on past experience for a particular type of manipulation like that.

Mr. Brademas. It sounds like what we would call a bill for the relief of Dr. Cole; that is what we would call it around here.

Mr. Cole. In part.

Mr. Brademas. Is this a privately operated institute you have in mind, then?

Mr. Cole. It is not to be a part of the Government. We all feel strongly on that. But in the Ecological Society, our real prototype, I think, was the National Center for Atmospheric Research in Boulder, Colo., which is an independent body run by a consortium of universities but funded as a line item in the National Science Foundation budget, so these are the terms we were thinking in, and then we have been approached by spies from various foundations who usually identify themselves as spies from foundations, and there is enough interest in this so I feel that it may be possible also to get private endowment behind it, which would be highly desirable.

Now we have reached the point where we have to start talking about where to put it and how to organize it and how much it is going to cost. So we felt here completely out of our depth. So we went to National Science Foundation for funds to have a management consultant firm to do a feasibility study for us.

We received bids from five such firms and went over them and met and accepted the one from Peat Marwick Mitchell & Co. here in Washington. They proposed to do the study in two parts: first, the feasibility study to see what the needs are in various segments of society, what people want, what use they would make of it and so on; and if the results of that are positive, that it is feasible and needed and desirable, then they would go on to part 2.

The part 1 has been completed, and the conclusion is that it is feasible and desirable and that we should go ahead. The report on that has just been, within the week, taken into National Science Foundation, and we are going back to try to get funds to finance part 2, or phase 2, which will get down to the details of organization and location and staffing and size of computer that we would need and many things of that sort.

Mr. BRADEMAS. Dr. Cole, I have several other questions, but I think I will yield to the gentleman from New York, Mr. Scheuer, who has long had very deep interest in this whole field of environmental problems, as you may know, and who participated in the UNESCO Conference in San Francisco some weeks ago and is a cosponsor of this measure. Mr. Scheuer of New York.

Mr. SCHEUER. Thank you, Mr. Chairman. I certainly want to thank you for the strong support that you have given those of us who have been deeply interested in this problem. Dr. Cole, I share the fears of some that the current interest in ecology and environment may be a fad that is looked upon by many as a public relations gimmick and that we are applying bandaids and cosmetics where basic surgery and summary structuring of our basic institutions is much more relevant.

Let me read a quote from the New York Times of March 17: "Senator Muskie and two scholars agreed that Americans may have to hold down their standard of living to hold down pollution. They cited fast automobiles, supersonic transports, disposable bottles, and more electric powerplants as some of the things they may have to give up to help save the environment.

"Mr. Muskie said: 'In a consumer-oriented society, everything we produce leads to waste. Maybe we ought to set some limits on the standards of living'."

Now, just to take electric power, people, who are far more expert in this area than I, feel there is no way that we can produce electric power either through fossil fuels or atomic energy that does not have some fallout in affecting the environment.

Probably as hopeful an answer as any to the problems of environmental pollution is deemphasizing additional use of electric powers for hair driers, electric carving knives, and so forth.

I don't want to put words in your mouth, but do you feel that one of the benefits of an education program in our schools on environmental issues is that it may give the future citizens and the future voters of our community enough understanding of the dire effects of current practices in the production of both goods and services that cause pollution, may give them the understanding by legislation as well as by individual conduct that we have to change the basic ways of producing and consuming things?

Mr. Cole. I would agree entirely with that. This education is sorely needed. Now, I don't quite agree that it may be necessary to cut back the standard of living. It should again be looked at as a system. This country, this earth can support a population of people indefinitely at just about any standard of living that you want to set up, but it can't do it for this large a population. Well, this is the key to the whole thing. Instead of giving up all of these things that are considered to make a high standard of living, let us see how large a population we can support without the environment deteriorating and still maintaining the standard of living we want.

This is a very multidisciplinary question, because it is apt to involve not only ecologists and demographers but sociologists and a lot of other people. We can still have automobiles with internal combustion engines without using fossil fuels. We can run them on alcohol that is grown as a crop. I don't know that we can run as many automobiles as we are running. We don't have to have these automobile graveyards. I think if Congress would repeal the depletion allowance for mining, that those graveyards would start disappearing if it became as expensive to mine new metal as it is to reclaim the used metal.

So people do need to become aware and concerned about this and understand that it is this population explosion that is at the very heart of the thing, and when people say to me, "This population is, or the United States is, not overpopulated; we have lots of space," the answer is that perhaps our population explosion is the most serious one in the world because while other countries are growing much more rapidly, in terms of the resources it is going to consume and wastes it is going to produce, one American is equivalent to about 80 Indians, so this affluent society of ours with still a growing population is a terribly serious thing which I am trying to get across to the people, but I am sure a program in the secondary and elementary schools, if you started there, would make this go much more rapidly.

Mr. Scheuer. How do you feel we ought to devise a national population policy or program? What is our maximum level of population or what is the maximum rate of population growth?

Mr. Cole. The population in this country now is estimated at 204 million, and it is growing at 1 percent per year at the present time. The number that could be supported I don't know, and I wish I did know, but we can't seem to inspire these people to get together from all of the various disciplines, and particularly the economists, who usually can't conceive of a steady state economy, and to try to see.

Mr. Scheuer. Can't conceive of what?

Mr. Cole. Steady state economy.

Mr. Scheuer. High static economy?

Mr. Cole. Yes.

Mr. SCHEUER. Do you feel we ought to have a zero rate of population growth in this country?

Mr. COLE. I suspect that it ought to be negative for a while, that we are larger than we can support indefinitely now. I recently put forth my views on the strategy for achieving population control in this country. I did this in a group of demographers who were not sure it would work, but they didn't shoot me down hard on it anyway. Would you like me to go into it?

Mr. SCHEUER. Yes.

Mr. COLE. First, of course, I would completely abolish any tax incentives for having large families at least beyond the second child. I would make all of the contraceptive advice and equipment available free to everyone. This is important because the moment you start discriminating, saying this is for the poor, somebody is going to charge you with attempted genocide and this can be used for political purposes, so this ought to be across the board and preferably without cost.

Mr. SCHEUER. I have been active in the field of population and have cosponsored, along with Congressman Brademas, a bill that Senator Tydings is going forward with on the Senate side for complete reorganization of the family planning programs; I have come across this cry of genocide but I never heard a woman use that phrase, never heard a woman in the childbearing years who needed family planning advice and equipment to preserve her options. I have never heard such a woman expressing the view that giving her options constitutes genocide. Excuse me; I didn't mean to interrupt.

Mr. BRADEMAS. If the gentleman will yield, what he said reminds me of a conversation I had in Huila, Colombia, a few years ago at the first pan-American assembly on population problems with the former President of Colombia, Dr. Camago, who had been President and was thinking about running again. He made a speech opening or keynoting this assembly which was in a very conservative Catholic part of Colombia, and he concluded his speech by saying, "We need birth control, and the only economic answer or political answer, the only Christian answer is birth control, and the sooner, the better." It was quite a revolutionary statement for him to have made and I asked him at the reception following: "Mr. President, do you plan to run again?" And he said, "After that speech, I doubt if I would have much of a chance," but he added—and this is what Mr. Scheuer's statement reminded me of—"I would get the women's vote."

Mr. COLE. Next I would make legalized abortion available.

With better methods, the Europeans are way ahead of us. I saw an account of one series of 20,000 abortions in Europe where only two women had to be hospitalized. They had more advanced techniques and it was as simple as having a tooth filled. Singapore recently made abortion available on request for a woman in a state hospital at a cost of $1.50, which is certainly nominal enough.

This would take care of the family planning part and get rid of the unwanted children, but I don't think it would solve the population problem.

Taking Cornell, even among the professors a survey showed they wanted an average of something like three point four children.

Mr. SCHEUER. I think the Gallup poll shows 40 percent of the couples in the country want four kids or more.

Mr. COLE. We can't fine people for having extra children, because the worst offenders wouldn't be able to pay and we can't give tax incentives for having extra children, because many of them don't pay taxes anyway, so what I would propose is to give them a bonus, and just to pull a number out of the hat, give every woman aged 15 to 44 in the United States, whether rich, poor, married, unmarried, black, white, or whatever, an annual bonus of $100 for every year she does not have a child. This would furnish some of the feedback, the incentive which I think might just work.

There are 40 million women in this category in the United States. If you want to keep the population constant, 2 million of these women approximately should have a child each year, so we are talking about a budget item here of $3.8 billion, which, by a strange coincidence, is almost identical with the NASA budget.

Mr. SCHEUER. Are you going to address yourself to the question that some people have raised, not just the matter of unwanted births but some kind of control of wanted births?

Mr. COLE. I would try to do it by this incentive method, to make them want fewer because it would be to their financial benefit to have fewer children. If that sort of system, financial incentive, does not work, then we are in trouble because you have the fact that any steps after that are going to be unpleasant to society.

Mr. SCHEUER. Is anybody doing any thinking along those lines?

Mr. COLE. I am sure a lot of demographers are thinking about it, but whether any of them feel they have the definitive answer or not I don't know.

Mr. SCHEUER. I enjoyed the testimony very thoroughly.

Mr. BRADEMAS. Mr. Hansen.

Mr. HANSEN. Thank you very much. Let me join my colleagues in welcoming you to the committee and apologize for my brief absence to present testimony at another committee this morning.

The dialog that I just heard causes me to confess that as the father of seven children I am obviously part of the problem we have been discussing and maybe have a heavier obligation to contribute to the solution.

Mr. COLE. I have a Catholic former colleague that has seven children and now he is a convert and all for legalizing abortion. It just took too long to educate him.

Mr. HANSEN. Let me direct a question related to this matter of developing curricula in the schools as part of the environmental education program. I am wondering if you could discuss some of the components that should be included in an environmental education curriculum at elementary, secondary, and college levels.

Mr. COLE. I fear I am less qualified at the elementary and secondary level than just about anybody you might get in here. It came as a great blow to me to learn years ago that at Brookfield Zoo in Chicago, the most popular single exhibit was a dairy cow. These children found out for the first time that milk does not come from bottles, and when you are dealing with population that is cooped up in the inner city in that way, I am sure they don't feel a part of nature at all.

I have seen big businessmen who just gasped if I would tell them that their survival depends on green plants. They think then a while and say, "Yes, our food does come from plants, doesn't it," but you try to tell them that their survival depends also on nitrogen fixing bacteria in the soil, and they think you are crazy.

So I don't know what you would do, particularly in the inner city life. If you can get out into the field and show the kids some of the interrelations of plants and animals and explain to them how these ecosystems are working, I think the skilled teacher can undoubtedly get a great deal in the way of the basic principles through to them.

In the colleges, I will refuse, myself, to teach ecology without laboratory or fieldwork, but a few years ago two of my colleagues decided to take the plunge and give a principle of ecology course that was open to anybody and did not have laboratory and fieldwork. The result of this was that they were flooded with people. The course is still going. It has over 100 students every semester now. It is given in both semesters of the year and, interestingly enough, a large number of these students are people from the college of engineering and places of that sort who never get any exposure to ecology otherwise; so I think they were right and I was wrong in making this decision.

We put in another course to go along with this one to follow it by a semester which is sort of a how-to-do-it course, and we limit it to 24 of the most interested students who want to learn something about what they can do in the laboratory and in the field, and so I think to reach the large population, I think this is very important.

I also feel it is important to try to get some ecological thinking, some of these very broad principles or sorts of things I have mentioned here today, to the entire college population, preferably at the freshman level. This would be possible in some schools—at the University of Chicago, for example, where all of the freshmen take a biological science survey course, this would be easy to do. At Cornell, it would not be easy to do. It would mean putting in a new required course at the freshman level somewhere and we would have to be persuasive about wanting it to get the academic policy committee to approve such a thing. It might go out again the next time the dean changes.

So this would vary from school to school, but I feel it is vitally important to try to find some way of doing this.

Mr. SCHEUER. Don't you think that, in addition to courses on ecology and environment, it would be worth while to weave some material on ecology and environment into courses on literature, economics, history of America, so that no matter what course you take, somewhere along the line you are going to learn about the environment?

Mr. COLE. It certainly would be desirable. But I can't even communicate with our economists. I have one who is a good friend and neighbor of mine, and we can't talk about these subjects, because to him continuous growth is necessary. You grow or you die. So I feel pretty frustrated.

We set up something a few years ago called Center for Environment Quality Management, and it was originally viewed as a grouping of engineers, system analysis people, with ecologists and epidemiologists and social scientists, and by the end of the year, we found that the engineers and the ecologists and the epidemiologists were communicating very well but none was communicating with the social scientists, so they are just out of the program, although we are sorry about this.

We feel very definitely that economics and things of that sort, sociology, have to be involved. But it is going to be difficult to find the right people, and I can think of only one economist in the United States that I know for a fact will go along with the notion of a nongrowing economy. I can think of only one professor of government in the United States that has a strong feeling of the way ecology ought to be brought into government planning.

Mr. **Brademas.** Is that Dr. Caldwell of my State?

Mr. **Cole.** Yes; the economist was Kenneth Boulding, University of Colorado.

Mr. **Brademas.** We hope to hear from him in our California hearings.

Mr. **Hansen.** Speaking of this question, if our effort to stimulate programs of environmental education are to be successful, some of the most immediate and prime targets have to be educators, those designing the courses. I have no further questions.

Mr. **Cole.** Mr. Chairman, if I may, I forgot to mention one thing here. This part of the bill on page 7 that disturbed me as to how you specify what those people are, I have been thinking at odd moments, trying to come up with some way to do this, and I realize that it is a terribly difficult problem, and the best thought I think that has come to my mind—and whether it is the right one or not I don't know—would be to seek advice from the appropriate professional societies when you decide what areas are to be covered in this matter. I am sure the Ecological Society of America or any other appropriate society would be happy to provide you with a list of names.

Mr. **Brademas.** We shall certainly take that specific recommendation into account as we move ahead on the bill, Dr. Cole, and I know I express the views of my colleagues on the subcommittee in telling you how grateful we are for you to come and give us this most helpful testimony. Thank you, sir.

STATEMENT OF DR. JOSEPH SITTLER, THEOLOGIAN, UNIVERSITY OF CHICAGO

Mr. **Brademas.** The next witness is Prof. Joseph Sittler of the Divinity Schools of the University of Chicago.

Although it may be surprising to some that we have invited a theologian to testify on this bill, it was my own feeling that it was important to establish at the outset of these hearings that when we are discussing ecology and the environment we are talking about matters that go far beyond control of pollution of land, air, and water. We are really trying to wrestle with some of the fundamental values of human life. For that reason, Dr. Sittler, we thought it would be most helpful to our thinking if we invited you, a distinguished American theologian who has, more than most others, considered the relationship between religion and the environmental crisis. So we are pleased to hear from you.

Dr. **Sittler.** Mr. Chairman, I feel there is a certain embarrassment in following the previous witness, because I am a father of six children and have made more than my proper contribution to the population and pollution he alluded to. But I think there are dimensions to this problem to which the disciplines in which I am involved are relevant.

I am not only a professor of theology but also have something to do with American culture courses.

It seems to me that if one wants to adjudge the relevance of this bill to the problem we all confront, one has to put it in a pretty broad context. And one of the last statements of the previous witness gave me the chance to do that.

It seems to me that unless somehow we understand our American story in another way, we really don't take the measure of the crisis in which we are involved.

In 1901, Frederick Jackson Turner made a famous speech called "The Frontier in American History"; he was then president of the American Historical Society. He made the point that our whole American understanding of our national endeavor in this place has been dominated by the fact of virtually unlimited space in which the American space has unfolded itself. For almost 300 years of our life the unlimited American space has meant that we could give very little thought to the consequences of operating in this space according to the desires of the moment, what seemed to be the economic opportunities of the moment. We did with American space whatever the needs of the moment required.

Dr. Turner pointed out that the frontier is now closed. A national mind which continues to operate as if the virtues that conquered the frontier can also sustain a tightly, ecologically constituted, national community, is an error in historical judgment. The frontiers did evoke magnificent virtues which we must honor—independence, resoluteness, personal responsibility, family and community cooperation—and these virtues must not be given a negative judgment. But we must raise the question: Are the virtues that conquered a continent sufficient to sustain a national community? Must there not be other ways of regarding our life and looking at our future?

It seems to me that the bill proposed envisions that. We have here a bill that is not pointed to something: it is pointed to everything, because ecology by definition is simply the acknowledgement that everything is involved in everything.

If you pull one dangling cord of nature you begin to unravel the whole fabric.

Now the question is: Is an attempt to attack that problem such as this bill represents a reasonable and intelligent attack? In my judgment, it is not only those things, it is educationally the most vulnerable place whereby to attack the problem, because this bill aims to pour the ink in the spring, as it were. Right at the beginning, when a child begins to understand and remember throughout his unfolding career, that people and bugs and snakes and air and water somehow belong together, and that these things are all bound together in the bundle of life. This is a fundamental human apprehension, which, if not quickly gained and steadily nurtured throughout an educational process, simply creates a generation of beer can flingers who simply do not understand.

Speaking then, not as a theologian but rather as one who has been for 28 years involved in education, I can think of no proposal to growing young people which, given the advantages of visual aids and multi-media presentations, would excite so vivacious a response. For it deals with what children know to be true, that if one kills vile snakes, he also destroys lovely trees, because the vile snakes eat the bugs that prevent the destruction of the trees. It is not a great intellectual achievement to know this; in a sense it is the primitive knowledge that a child already senses that things belong together.

I think the bill, inasmuch as it is directed toward a presentation of "how man lives in this bound-together world," if administered with intelligence, and, as my colleague suggested, with a calling upon the ecological, pedagogical research know-how that is already available, would be a significant contribution directed to the tenderest spot in the public response.

Thank you very much.

Mr. BRADEMAS. Thank you very much, Dr. Sittler.

Without objection, your prepared statement will be included in the record as if read.

(The statement follows:)

STATEMENT OF DR. JOSEPH SITTLER, THEOLOGIAN, UNIVERSITY OF CHICAGO

Because the national need to which this Bill addressed itself is a complex and a delicate one, our reflection about it requires a level of thought far deeper than is commonly required for a judgment.

What man does with the world-as-nature is a result of what he *thinks* about nature; it is shaped in the profoundest care of what he *feels* about the natural world, what evaluation he has of the world of things and plants and animals.

If the world of the not-self is felt as a mere resource to be used it will surely be abused; if the world is regarded as a gift, a wonder, as a reality having an integrity of its own—it will be rightly used.

That proposition is swiftly and powerfully true: and our present ecological crisis is a result of the denial of its truth. For nature, though often silent, is not without power to condemn as well as power to bless man. And when man so uses nature as to deny her integrity, defile her cleanliness, disrupt her order, or ignore her needs—the reprisals of insulted nature take an often slow but terribly certain form. Nature's protest against defilement is ecological reprisal.

Man cannot be man against nature; he can only be man with nature. For man belongs, too, to the world-as-nature. If out of ignorance, or apathy, or aggressiveness he tears the fabric of which his own life is a part, he destroys himself as well as the mighty structure from whose womb he was born, in whose web he has had his unfolding history, and whose support and companionship-in-life is the primal place and ground of his existence.

Managerial-man forgets this. Nature is patient. She permits him to make steel out of ore, and limestone, and coal and sophisticated chemical operations. But if, in that creative and legitimate work he befouls the air, pollutes the water, and deals rapaciously with the unretrievable and irreplaceable stuff of nature, patient nature begins her quiet but implacable counterattack.

How, then, shall the mind and spirit of a nation be addressed by this ecological fact—that man and nature are bound together in the bundle of life?

Education is not the only way; but it is an important way. And, speaking as an educator, I can think of few areas of life that could be so naturally fitted into a course of study. For the things ecology points to and deals with are the immediate actualities of our lives: air and water, plants and animals, forests and bugs and birds and spiders and snakes. And the high specialization of man's historical life whereby a primal organic wholeness of life is ever more deeply threatened would, in my opinion, guarantee a student response of great vivacity. For what is happening to fragmented man as a human person confronts in the vast ecosystem of nature a model of community, interdependence, and balance which, beheld and honored, bestows upon man a vision of wisdom, and order, and is tutorial to the future of man is history.

For the possible correction of the wrongs we have done in the past there must be regulative, protective, ameliorative action directed to the producing, fabricating, consuming, beer-can flinging adult public. But the action this bill proposes, because it is addressed to the young, is even more crucial. It is directed toward restoration of a rational way of life—and its truth, because a part of public instruction, is truth poured into the very spring of the future.

Mr. BRADEMAS. Let me refer to the famous lecture that was delivered by Dr. Rene DuBois in October 1969, "A Theology of the Earth," in which Dr. DuBois took issue with the thesis of Prof. Lynn White, Jr., out in California, which thesis on the part of Dr. White was that the Judeo-Christian tradition had been of considerable influence in bringing about the erosion of the environment, certainly in the United States.

Dr. White, you may recall, from that essay, alluded to the first chapter of Genesis, in which it is written that man and woman were given the right to subdue the earth and have dominion over all living things. Dr. DuBois quarrels with Dr. White at this point and suggests that the ancient Greek and Chinese and Moslem civilizations didn't have that good a record in terms of their respect for the earth.

What do you think about that as a theologian?

Dr. SITTLER. I checked that out just before I left to come down here; I knew of Dr. White's article and also Dr. DuBois' response. And I spoke yesterday afternoon to the professor of semitic studies at the Oriental Institute. In the semitic language what does the verb "to have dominion" mean? And he said "to have dominion" means exactly the opposite of what it has been thought to mean when one translates from Hebrew into Latin, which was one of the earlier translations of the Bible. The term is understood as "domination," a kind of political word meaning "to exercise control over," but the proper translation would be "to exercise tender care for." And this is almost a 180-degree shift in the meaning.

Understanding Genesis in its context, man was ordered so as to live with God's other creation, the earth, that he was to regard her as the object of his guardianship. In fact, the word is used in the sense that man is to care for, he is to have dominion in the sense of exercising his intelligence to see that her integrity is not abused.

So I think Lynn White is right when he says that, on the whole, the tradition has been misunderstood to mean that man is given a holy charter to walk through the creation in arrogant haughtiness and do what he pleases with it—which is exactly the opposite of the intention of the statement in Genesis.

Mr. BRADEMAS. I wonder if the new English version takes that into account in translation.

Dr. SITTLER. I just checked that out in the New English Bible, which 10 days ago, with considerable publicity, was announced by the publishers. The passage is translated in such a way as to suggest to the mind that the relation is not one of arrogance or overlordship but is one of care and responsibility.

Mr. BRADEMAS. There is one other question I would put to you, deriving again from that lecture of Dr. DuBois.

You will recall that he was commenting on Lynn White's lecture in which there was the statement, "St. Francis of Assisi ought to be the patron saint of all ecologists." But DuBois said, "No, it ought to be St. Benedict, because he relates creative intervention"—alluding to interventionaries of medieval times and since St. Francis symbolizes passive worship of creation.

Do you have any comment on that particular squabble?

Dr. SITTLER. I should like to relate these two statements by introducing a third one. I think both men are right. Let's introduce the third man and then interpret the others.

St. Augustine made a marvelous statement once, in which he said: "It is of the heart of evil that men use what they ought to enjoy and enjoy what they ought to use."

Now, he meant by that, as the context makes clear, that unless one stands before the world with enjoyment, that is, with appreciation of its wonder, its beauty, its otherness than myself, he will certainly abuse it. If he enjoys the world for itself, then he must be trusted sanely to use it because he regards its own given nature.

Now, I think both Francis and Benedict deserve to fit under that category, because Francis, as it were, was the apostle of the enjoyment of the wonder and beauty and freedom of nature, and Benedict was the saint who affirmed that.

Men are supposed to deal with nature, our sister, in such a way as to managerially unfold here toward her fullest possibilities.

Well, Benedict is probably the father of contour plowing, and the Benedictine Order for many generations or centuries taught medieval Europe how to deal with earth, trees, plants, animals. The monasteries really were for hundreds of years the school in primitive ecology.

Mr. SCHEUER. They were your ecological institute.

Mr. BRADEMAS. Thank you very much, Doctor.

Mr. Hansen?

Mr. HANSEN. Let me also express my appreciation for your presence here and your testimony, which has been fascinating.

My only question is whether you see in the legislation before the subcommittee a promising and productive approach to the development of the kind of understanding that you spoke of. Will this be a useful tool in achieving this understanding of nature and of our responsibility?

Dr. SITTLER. I think, sir, it can be a useful tool, if, as the thing passes from vision and enactment into exercise, it is not permitted to fall exclusively into the hands of the educators. For this reason: There must be educationally, pedagogically trained, people involved. But I fear for any effort which falls too absolutely into the hands of those whose only training is procedures of pedagogy. There are dimensions of this problem that are visual, poetic, spiritual, historical, economic; it is a very large bag. And I have been an educator long enough to fear my own crowd and its over-specialization.

We tend, as other segments of society, to imagine we know more than we know and to think of ourselves more highly than we ought to think, as St. Paul says. So the approach must be many dimensional.

I suggest, sir, that it would be highly appropriate that in a kind of elementary and secondary school education aimed to awaken man to his existence with the fellow creation, that not just statistics or before-and-after pictures, and so forth, but aspects of American literature in which we encounter a marvelous body of material dealing with problems of this kind, ought also to be introduced.

I am a kind of frustrated poet; and I shall not inflict that on you—but there is a body of contemporary poetry directed exactly to this question which ought to be in the curriculum just as *Alice in Wonderland* was in the curriculum of my childhood.

Mr. Hansen. Are you saying also that in addition to the responsibility that educational institutions may have, that others, such as churches, other noneducational institutions and organizations, should in some way be brought into this process and come within the scope of this legislation?

Dr. Sittler. Yes, sir; I think that would be true.

Mr. Brademas. If my colleague would yield; am I not correct in understanding that the National Council of Churches is now beginning to do something in the field of ecology and that people in your profession are beginning to consider, as a responsibility, thinking through the religious implications of the ecological crisis?

Dr. Sittler. Yes, belatedly, I think they are. I am writing a book on the subject, and some of my colleagues in other areas of Biblical, theological, historical work are beginning to work on this matter. So there is a rising tide of imaginative and scholarly work.

Mr. Hansen. Thank you very much, Doctor.

Mr. Brademas. Mr. Scheuer?

Mr. Scheuer. Well, we all thoroughly enjoyed your testimony, and I know you have given us a number of things to think about, Dr. Sittler.

You may have heard that Dr. Cole testified on the matter of population, and I suggested we ought to have a zero rate of population growth. He answered to the effect it probably ought to be a negative rate. We probably ought to have a declining population for some period of time.

Now, here we are getting right into the domain of the theologian, and I think it would be interesting to us if you would give us the views of an eminent theologian on how we ought to be approaching the business of cutting down on national population, policy, and program, and how do we relate the individual created in the image of the Lord, everybody's Lord, with all of the individual rights and dignities of the uniqueness of mankind? How do we rationalize our long-held religious and political precepts of the uniqueness of the individual and his dignity and integrity with the insistent demands of our environmental ecological theories for a stable if not declining population?

Dr. Sittler. Mr. Scheuer, I too have been involved in reflections about this matter with my colleagues in the theological community from the various Christian and also the Jewish community, and I know something about that.

Let me say that the definition of the "good and the moral" is more and more being understood not to be a static or a given pattern but is one which seeks in a moving, changing, dynamic, unfolding understanding of history to redesign and restate what is the "good," the "moral," the "fitting" in any situation. And the two positions standing over against each other are really the old traditional Roman Catholic position of natural law, which can be interpreted to mean that interference with reproduction is an offense against natural law.

But there are theologians within that community, too, who are saying, "That is one way to read natural law. But if nature changes in regard to man's relationship to it, and if man's relationship to the world, as nature results in too many people, then the intention of natural law can be understood in another way."

Mr. SCHEUER. Thank you very much.

Mr. BRADEMAS. I have just one other question. Dr. Sittler, before we let you go. And that is a rather fundamental question in this country right now. And that is—and it has been alluded to by Dr. Cole—the worship, as it were, of the almighty "GNP." The question is if we are really going to make any significant headway in meeting the whole spectrum of issues that we call "the environmental crisis," must we require a fundamental shift in the values of the American society no longer believe that a constantly rising gross national product must be the fundamental public and private objective of this society?

And in this respect, I note the statement of Dr. Murray Gellmon, the California physicist who won the Nobel Prize this year, in which he said something to this effect: The mark of a really mature and civilized society is its capacity to decide not to do certain things of which it is technologically and scientifically capable.

So I guess the question is: Are we really going to be able to do anything other than saw at the wind in this field unless we move toward some fundamental shift in values in this society?

Dr. SITTLER. This is true. It seems to me the relevance of this bill is that it understands, at the point of priority of value, the crucial point. There must of course be legislation to restrict, ameliorate, to correct and do something about past blunders. But this bill moves at another level it seems to me. It seeks to shake the value-choosing minds of the future rather than do a kind of vacuum cleaner job on the mess of the past. There has to be some of that done, to be sure.

But the bill is for the next century, not for the next biennium; will men really come to see this?

Well, maybe: There is a beautiful phrase in the Old Testament: "The Lord gave them what they wanted and made them sick of it."

This may be the way the human mind changes—by a sheer surfeit of quantum, within which one begins to create the distinction between quantity and quality. This comes, I think, in the mood of the generation now coming to maturity, in which they have so much that falls apart so fast that a longing for sheer craftsmanship, or the less that is better, is not beyond the realm of possibility. We might be in again for an age of hand craftsmanship in certain things.

I am not a pastoral romanticist, and I do not think tractors can be hand crafted to deal with the land. But there are evidences in the culture of a kind of sardonic evaluation of sheer quantity, a line that goes always up on the graph, to which my own kids say, "Very big deal. So what?" But I understand them, because as my car falls apart every fourth year, I say the same thing.

Mr. BRADEMAS. Dr. Sittler, thank you very much indeed for your eloquent testimony.

Dr. SITTLER. Thank you, Mr. Chairman.

Mr. BRADEMAS. Our final witnesses are two distinguished American contemporary artists, Mr. Robert Motherwell and Helen Frankenthaler.

Would you like to come forward, please. We look forward to hearing from you.

STATEMENTS OF ROBERT MOTHERWELL AND HELEN FRANKENTHALER, ARTISTS

Mr. **Brademas**. Mr. Motherwell, we are glad to have you with us, sir.

Mr. **Motherwell**. Thank you. I must begin by saying that my wife wishes me to speak for both of us, though she was invited to speak in her own name, as Helen Frankenthaler.

Mr. **Brademas**. We are in an era of women liberation. And, as a bachelor, I find it enormously reassuring.

The Chair wants to say how very pleased we are to welcome you, Mr. Motherwell, as one of the leading American figures in the world of art. We look forward to hearing what you may have to say.

I take it from your having been here on some of the previous witnesses' testimony, you may have some idea of some of the kinds of questions we hope we can hear from you on.

Mr. **Motherwell**. Thank you again. I regret that I only partially heard the second man testifying. I found beautiful and measured (and myself in total agreement with) Dr. Sittler who just preceded me. The following is what I wish to say today myself:

I am sure that scientists have or will testify to the relevant facts here and know them far better than I. I speak only as an artist. But to speak as an artist is no small thing. Most people ignorantly suppose that artists are the decorators of our human existence, the esthetes to whom the cultivated may turn when the real business of the day is done. But actually what an artist is, is a person skilled in expressing human feeling. And if the "real" business of the day has led to a distortion or a petrification of human feeling on the part of the participants, as, for example, when a builder mows down the trees on a tract of land because it is easier and cheaper to build the house on empty ground, and the worker who drives the tractor that plows down the trees to do his job in order to race home for a beer and a TV western does so, oblivious to the hurt to the landscape and the hurt to the ultimate house buyer, who—if he has sensibility and limited means—will plant saplings that will take a generation, or two or three, to reach the stature of the trees mown down in a few minutes—then we are dealing with a business of the day that makes the builder and the worker looking later at a masterpiece of landscape painting—say, a Constable or a Monet in a museum—a cultural transaction so grotesque and absurd that the most extreme plays of Ionesco and Samuel Beckett are less absurd than everyday life itself.

The first-mentioned playwright has said he has only felt "happy" when he was drunk, as millions of young people now seem only happy when drugged, which are indeed two ways of contending with the nausea that a person of sensibility must feel when he looks at the waste of modern civilization, covering the landscape like a slimy coating of vomit.

What kind of a race of men is it who can rape or vomit on the landscape, like drunken soldiers in a conquered village, or like destructive and greedy little boys let loose in an enormous toy-and-candy store, to break and gorge as they like; while other little boys, in other parts of this planet that we Americans are turning into a garbage dump, stand with a piece of string and an orange as their treasures?

As an artist, I am used to being regarded as a somewhat eccentric maker of refined, but rather unintelligible, objects of perception. Actually, those objects contain a murderous rage, in black and white forms, of what passes for the business of everyday life, a life so dehumanized, so atrophied in its responsibility that it cannot even recognize a statement as subtle and complicated as the human spirit it is meant to represent. I am as well, at other times, an expresser of adoration for the miracle of a world that has colors, meaningful shapes, and spaces that may exhibit the real expansion of the human spirit, as it moves and has its being.

But, as every artist knows, this is expressed in the middle of, and despite the vomit that surrounds us, a nauseous waste that makes the incessant and endless chewing down of trees by beavers, for instance, seem amateurish and almost benign, since they do not have the technology that we humans do to destroy on a huge scale. If we gave the beavers our tools, the forests of the world could disappear in one day. We are slightly more sensitive. It might take us a generation or two; or again, perhaps not.

We are certainly capable of destroying the forests of the world, of destroying everything that is not already covered with vomit, as well as everything that is, in 1 day.

I suppose that America began as a few people, on a vast tract of land, so vast that one could be as greedy and wasteful as one wanted, and there was still more. That time is gone. Now there are millions of people, and millions more in the offing: that vast land is becoming more the scale of a park, humanly speaking: but a park filled with waste: rusting cars, bottles, garbage, enormous signs seducing you to buy what you don't want or need, housing projects that don't show a rudimentary sense of proportion in any shape or line or material, suburbs that are a parody of the barrenness of the Bronx, and of the gaudiness of Las Vegas.

Indeed, if God had said to a group of men:

> Here is a vast park, of millions of square miles. Let's see how quickly you can cover it with everything that is an affront to the human spirit. And, above all, be certain that it is done on a grand scale of extravagance and waste, and of lack of regard for the sensibilities of the inhabitants of the other parks in the world.

Then we might by definition call that group of men that God so provoked "Americans."

No wonder our youth are up in arms! They are in order to preserve their sanity, in the midst of a vulgarity, a waste, a contamination without precedent in the annals of mankind. We talk about a "generation gap." I am more optimistic. I prefer to think of it as a "sanity gap," of a young generation saying (in the interest of their growing sensibility that they certainly did not inherit from their parents) to their elders, "The way you go on covering our natural park with filth, waste, and vomit for the sake of monetary gain and monetary economy is insane."

If most of the Members of Congress think that they are either leading, or in touch with the young, I would remind them of the masterpiece of Renaissance painting by Peter Breughel the Elder, called "The Blind Leading the Blind." Congress may be leading or mirroring the so-called silent majority, but persons of sensibility are regarding the scene of vomit with the only possible sane response, one of "nausea." And no men, if they can cure it, will endure a state of nausea for long.

I do not know how you legislate the growth of human awareness, or how you make shameful, insensitivity to landscape. But if the present bill can in any way do either or both, who could not favor it? Each of us lives a brief moment in what once was a primordially beautiful park that could only elicit a sense of ecstasy and the natural music proper to a virgin place. Does that moment for us now have to be spent surrounded by our own filth, so much of it that it is a problem even to cart it away? What kind of a human existence is that? A gift to our children?

No, it is a dirty joke and a senseless one, and not God's, but our own.

That old cliché, the word "mess," is now taking on a vivid and literal meaning. The American landscape is visibly and literally a mess; the young know it. Let us give them all of our positive knowledge. It is little enough compared to the mess we have given them.

If you want to drive anyone insane, rear him in an environment without a sense of limits. And even our vast reality now is limited indeed.

One's mind reels at what men without an esthetic sensibility have been capable of. Far from being merely decorative, the artist's awareness, with his sense of proportion and harmony, is one of the few guardians of the inherent sanity and equilibrium of the human spirit that we have.

Keats' famous line, "Truth is beauty, beauty is truth," should be regarded as an obvious fact, not an enigma. What is enigmatic is that a whole society—and our modern technological one, which we cannot lose if we would, is the first such one in human history—that a whole society can think that it flourishes when, in fact, its mountains of waste matter reveal a paralyzed and psychopathic state, in the sense of having no feeling, no response to the wondrously complex and sensitive perceptions that are the human spirit itself.

What have we gained in conquering a virgin piece of nature if, in the process, we have destroyed the sensibility with which the human spirit perceives the world, that is, if we have destroyed our capacity to feel? Everyone knows that absence of feeling is the prime characteristic of death. A lot of what we observe among the young these days is their various reactions to moving about in an environment devoid of basic feeling, so as to better manipulate nature in the interest of greed. In short, from moving about in an environment that is deathlike. If they go to extremes in their efforts to revivify our environment, it can only be because of the mortal threat to their lives and state of being that our landscape represents.

The French Surrealists like to think of themselves as "super-realists." In fact, they were subrealists, in their realism, compared to the nightmare of esthetic reality that we patriotic Americans have made for ourselves, without sensibility or principle.

It is interesting that the French have managed to engrain into a whole culture a sensibility as to what one eats. Each meal is a joy. I would that we could do the same in relation to the American landscape? How enhanced all of our individual lives would be!

Mr. EDMONDSON. Thank you very much, Mr. Motherwell.

I have been a member of this committee going into my 12th year, and I think your statement is as eloquent and moving as any I have heard on any subject coming before this committee.

One of the questions I would put to you follows from a statement made by Dr. Sittler, who preceded you in testifying. Dr. Sittler said he was not a pastoral romantic. And I think I am correct in quoting him in saying he was not really suggesting that we could somehow return to an earlier day. We live in a country increasingly urban. You live in the greatest urban area in the country.

What comments could you make on the problem of developing sensitivity to the values of which you speak, in an increasingly urbanized society like ours?

Mr. MOTHERWELL. A return to the past is plainly not possible. I might remark further that somehow in America the answer to every problem always seems to be more education. I have, in my time, been a professor. I still lecture occasionally at universities and work for the J. S. Guggenheim Foundation. Which is to say I have seen at firsthand the educational process, at least part of it.

I am in agreement, if I understood him correctly, with my predecessor that education is not nearly as efficacious as we would like to think. One's real awareness is what immediately surrounds one, in one's family, and among one's friends, and in one's neighborhood, and so on. When one thinks about—and I dislike using such a refined and foreign image—when one does think about the beauty of French cuisine, from the peasant to a restaurant like Maxim's, it is evident that such awareness could only come about from each member of a culture being very clearcut in his perception of what he is involved in. Let us say, in a way that is similar to what most American males are aware of in a baseball game: they immediately show their anger or displeasure if something silly and ridiculous is done. So the French with cooking. But that man who, in this sense, can see the beauty and strategy of baseball, is equally capable of going home and remodeling his house with ugly windows put anywhere, with no sensibility. And this latter is also a game that has enormous effects on our sensibility—I dislike the word "sensibility," because it is not strong enough, and maybe as an artist I have an exaggerated visual sense: Sometimes I feel like my body is covered with eyes, like Argus. But you can't imagine that if one has accurate and clear eyes, how things are crafted, or how the scene one is driving through on a highway or street affects one's eye.

Last night, coming back to New York City from New England, I was tired and mistakenly got off the parkway into White Plains. The endless gas stations, motels, road signs, couldn't lead to anything but my thinking, clearly, that here is a place that is saying, "If you stay here, you can make a quick buck." To put it another way—and here one is dealing not only with theological and aesthetic problems, but with economic motivation: "Does a society, in order to function, have to have greed as its real motivation?" I say this without being unaware of the extraordinary things that America has also accomplished. Indeed, the fact that you here can present such a bill, the fact that an artist such as myself would be asked to speak about it, is an extraordinarily civilized accomplishment.

Mr. BRADEMAS. I know last year when Congressmen Foley and Udall accompanied me in Japan for a conference, we stayed a few days at a Japanese inn in Kyota. We were delighted and enchanted by the noncommercial low-key nature of our surroundings, so much so as we considered the outrages perpetuated on the American people by nearly every major motel chain in the United States, that we maybe ought to go into business for ourselves and set up our own chain of Japanese style inns without any signs around it. And we concluded we would probably go out of business.

Mr. MOTHERWELL. Maybe not. You would certainly get a lot of young people, and artists.

Mr. BRADEMAS. You said another thing that struck me as interesting, Mr. Motherwell. You said that the artist, with his sense of harmony and proportion, is one of the few guardians of sanity that we have in our society. You also remarked that you were perhaps not sure exactly how we could resolve the problem we are confronted with. But what ought to be the role of the artist? This is the big question, and this is your fundamental question, I take it, what should the role of the artist be to help shape the kind of sensibility, or any stronger word you may wish to use, that would be required in a country like this, if we are going to make any significant advance in coping with the attack on the environment?

Mr. MOTHERWELL. Well, I suppose as an artist, per se, one has to go about one's art of making things that are sufficiently beautiful in terms of their expressive purpose. Perhaps if another's sensibility is trained on them, it in turn will gain some sense of proportion and color. But, as social individuals, apart from being artists, it seems to me that artists (and intellectuals in general) can only do one thing, which is, constantly, like gadflies, to bite the bottom of whatever horse that is running the world, to make it aware—of course, we are brushed off as easily as a horse brushes flies off with his tail. Nevertheless, the American tradition—sometimes I think New England should have been called "New Scotland;" I say this as a person of Scottish descent—the American emphasis on the "practical," which makes it possible for us to do some quite extraordinary things, is nevertheless a prison for other dimensions of the human spirit. The aspiration of life is joy. Otherwise, life is unendurable. In the end, our real political instincts are not about parties or systems of government, but about those situations in which the "establishment" is obviously depriving the people of any joy in just being human beings.

Mr. BRADEMAS. I could put many other questions to you, but I want to be sure of my colleagues having an opportunity also.

Mr. Hansen?

Mr. HANSEN. Mr. Chairman, I also want to express my personal appreciation for a very eloquent statement. I think it is evident that these hearings, in addition to serving their intended purpose, will also provide a means for development of some rather exciting literature on the environment in the form of testimony such as yours and other witnesses we have heard this morning.

You have indicated, I think, quite correctly that the real problem is one of a development of attitudes, the shaping of values, if we are going to salvage environment that is our heritage.

Do you see any promising evidence of changes that at least are encouraging to you?

Mr. Motherwell. There is a bit, but you see it is always economically motivated, so it has its built-in probability of distortion. In consumer goods, for example, the Bauhaus of the twenties, which took the position (natural in Germany of the inflation of the twenties) that there is not room for many artists in society, that an art school could perform a more, in the best sense of the word, "reasonable" function by training first-class designers, such as the Japanese have developed over thousands of years; that is, instinctive awareness of what is proper to the object. So that now modern radios and household appliances, for example, after many, many years, have become much more agreeable, clean-cut, related in form to their purposes, as the Bauhaus taught.

On the other hand—I happen to be an automobile nut—I am always amused at the desperate effort of Detroit to deal with European cars, to make "smaller" ones, or whatever that they think is the attraction of European cars, when it is evident to anybody who loves cars the attraction of the European cars is they are made by a single man, such as Porsche, in terms of given limits, a thing that has the built-in integrity of what it is. While our instincts, built on forced mass consumption, are for a guess as to what a mass of people are going to *want*—everything is thought of that way. If the young cry out for anything, it is for men of integrity, but not in the sense of paying bills merely: no, men with integrity in the sense that they will not act against their feelings. This is more exceptional in English-speaking industrialized society than in others that are more "primitive" than we are.

It is also a problem of doing things on an enormous scale, which needs in turn enormous capitalization. Maybe we don't need to be so damned rich if each moment were more agreeable.

Mr. Hansen. You make reference to France, and our chairman also has made reference to the difference between our own society and that in Japan in this respect. Are we the worst or among the worst? Is this a necessary result of technological advance, or are there some other examples of countries of people around the world who have been able to achieve technological progress without destructive consequences that they have seen in this country?

Mr. Motherwell. That gets into a realm that is pretty much beyond my field. America had a potential advantage, which has turned out in many ways to be a disaster, of not having a long tradition. Certainly, a great deal of the beauty of a culture, like Japan, is something that developed over many centuries, and over centuries in which change was very slow; whatever had been achieved was deeply engrained in the society as a whole and in the individual, so that only something radically going wrong would bring about drastic change quickly enough to damage accumulated values.

We started from scratch, and sometimes, when I meet European artists and intellectuals who have a horror of "Americanization" in Europe who guard the esthetic, and other things, I point out what we have is the concomitant of an unbridled technology which they also will encounter; and, moreover, they must remember that what America largely is, is the invention of the poor people of Europe, given space and materials and money and time. This is what is meant by an "American."

Mr. Hansen. Thank you very much, Mr. Motherwell.

Mr. Brademas. Mr. Scheuer?

Mr. Scheuer. This has been an exhilarating morning. I couldn't agree more with my two colleagues. We owe a collective debt of gratitude, and I am glad your predecessors are still here, to all of you.

Mr. Motherwell, you mentoned in your testimony that we don't have to be so rich. I quoted Senator Muskie before as saying, "We may have to hold down our standards of living to hold down pollution."

In effect, aren't you saying that we can only maximize our richness, the real pleasures in life if we control our material production, if we control the exploitation of the countryside around us? Are you not trying to say that what we should be trying to do is maximize our richness, our satisfactions by perhaps moderating the production of goods and services and therefore achieving a higher quality of life?

Mr. Motherwell. Yes. In my opinion—and I am certainly no economist—emotionally speaking, I mean to use it as an emotional metaphor, we have a kind of laissez faire going wild. Esthetically speaking, the small businessman is often oddly more guilty than the large corporations. I mean, the guy who opens the corner drugstore or builds his own gas station or builds his own little business who is often more monstrous than a larger corporation, which, after all, does often employ architects and designers, and so on. But as long as it is a tacit assumption among us Americans that material well-being is alone deeply fulfilling, rather than, as it should be, the sine qua non of what is deeply rewarding, we have a problem.

We are essentially in a senseless situation, of which everyone who does not have a vested interest, who is self-employed, like myself, or young enough, is fantastically aware, and regrets, and feels helpless and futile at the same time. But if there is an "establishment." which sometimes I doubt, it seems to be a question in the case of individuals of thinking that somebody else is really the establishment; if there is indeed any establishment, it is certainly going to fall apart if it does not pay some greater heed to human feeling and sensibilities. We are marvelously educated now; we have succeeded largely in making men intellectually free; and once intellectually free, they will make themselves in their daily lives free from what they resent and feel repelled by.

But I am the eternal optimist.

Mr. Scheuer. And what role will you see the artist playing in this effort to give the establishment an ecological and environmental conscience? What role do you see the artist playing in this education process that we are talking about today?

Mr. Motherwell. It seems to me, you know, art is really very ineffective as a political instrument. I think art has rarely changed anything socially or economically. But it does have one extraordinary quality. It does reveal what the potentiality of what the human spirit really is.

When I listen to Mozart, then I know what a man is really capable of. Instead, we use the concept of the most ignorant and simple-minded member of society as sort of a "practical" yardstick by which everything is measured.

I think of polls—they show so many tens of percent, for this or that. There are perhaps 3 percent on the whole who are even aware of the implications of what is being asked!

Mr. BRADEMAS. I would just observe, with respect to what you just said, that one part of this bill provides for grants to the mass media for the purpose of educating about environmental problems. And as I say that, I am struck again by what Dr. Sittler says or by what one of my Democratic county chairmen in Indiana said when I asked about a political development. He said, "Well, John, a lot of things depend on a lot of things."

So he is kind of an instructive ecologist without knowing it.

In this subcommittee alone this year we dealt with the arts and humanities bill, and we also deal with preschool education. Now we are talking about environmental education. I think one does not have to ruminate very long to realize all kinds of interrelationships that derive from the fact that this particular subcommittee gets its nose into these various areas.

I don't find it frustrating, but, on the contrary, I find it kind of interesting, when I realize what this burgeoning experiment with "Sesame Street" can show us about how television can be used to help teach very young children.

Then I ask myself what might be done by American artists, and I don't mean only painters, of course, but musicians and poets and sculptors and dancers, and all of the rest of the artists.

We had, I remember, several years ago a luncheon here with several of your colleagues—I think Mr. Rauschenberg was among them—and talked about the idea of taking slide collections of distinguished American artists. And I am sure you would have been among them. These individual collections were enormously popular in Eastern Europe and in the Soviet Union, because there was a starvation, literally, in those parts of the world to know what the best American artists were doing. That is instructive, I think.

I wonder if we somehow, alluding to your phrase about artists being the guardians of sanity in a society like ours, can harness our technological capacity to teach—we also have educational technology in this committee, I should tell you to communicate to masses of Americans, the kind of sense of values you and your predecessors have been talking about here.

In other words, I am gently disputing with you. And I don't minimize the potential impact of what artists can do in a country like ours. Indeed, unless you help, I think we are really in deep trouble.

Mr. MOTHERWELL. Well, if the real problem is a change in human awareness, then we know from modern psychologists and from educators that it is a very long and slow process, if it is to be done in depth and really engrained. I am glad that you are beginning. Possibly one could do it vividly in terms of, let's say, a TV campaign, like the marvelous, I think, TV campaign against smoking. But what we are talking about is a kind of awareness that has to be with real truth, or it becomes corn, a distorted or oversimplified truth.

You see calendars everywhere of beautiful landscapes in Maine, for example. The Maine landscape is indeed beautiful. But the calendar renditions of them are, to anybody having artistic sensibility, pretty awful. So it is a very—well, it is almost like my being asked, "Can a theologian contribute to people having a great awareness of God?" Yes; but not easily or quickly.

I wish I had some concrete proposals for you, but I really don't.

Mr. BRADEMAS. Well, I will just make two quick observations before stopping.

One, I noticed in the Sunday *New York Times* a story on the architecture of Columbus, Ind., where, you may know, J. Ervin Miller of the Cummins Engine Co. has helped the committees work with a whole series of leading American architects. And Mr. Miller made clear it is his own judgment that the impact of these developments may not be felt for a very long time to come in terms of actually changing attitudes on the part of the people of that community. But he is clearly committed to the view that I think you have just expressed, that it has to be very good.

So maybe at least one answer is that the contribution of artists is to be a good artist in solving the kind of environmental crisis we have been talking about——

Mr. MOTHERWELL. If every man does his thing, we would have many fewer problems.

Mr. BRADEMAS. Well, that may be a good point on which to conclude these hearings.

Again, I want to express our appreciation to you for your splendid testimony, Mr. Motherwell, and, as well, to Dr. Sittler and Dr. Cole.

Unless my colleagues have more questions, the Chair would like to announce tomorrow morning at 9:30, in room 2257, we will begin hearings with the Environmental Teach-in Panel, followed by the editor of *The Environmental Handbook*, Garret de Bell, and other witnesses who have been organizing the teach-in.

We will adjourn for this morning.

(Whereupon, at 11:35 a.m. the subcommittee recessed, to reconvene at 9:30 on Wednesday, March 25, 1970.)

ENVIRONMENTAL QUALITY EDUCATION ACT

WEDNESDAY, MARCH 25, 1970

House of Representatives,
Select Subcommittee on Education
of the Committee on Education and Labor,
Washington, D.C.

The subcommittee met at 9:30 a.m., pursuant to recess, in room 2257, Rayburn House Office Building, Hon. John Brademas (chairman of the subcommittee) presiding.

Present: Representatives Brademas, Scheuer, Meeds, Bell, and Hansen of Idaho.

Staff members present: Jack G. Duncan, counsel; Ronald C. Katz, assistant staff director; Arlene Horowitz, staff assistant; Toni Immerman, clerk; Maureen Orth, consultant; Marty LaVor, minority legislative coordinator.

Mr. Brademas. The subcommittee will come to order for the further consideration of H.R. 14753, the Environmental Quality Education Act.

Yesterday, we on the subcommittee heard from an ecologist, a theologian, and an artist concerning the need for Federal support for programs to encourage education in elementary and secondary schools in universities and in local communities about the whole spectrum of environmental problems.

Today we are pleased to hear from some of the leaders of the environmental teach-in which is scheduled for the 22d of April, and we look forward as well to hearing from others who have been associated with the projected teach-in.

Tomorrow, in room 2261 at 9:30, the subcommittee plans to hear testimony from distinguished educators who have specialized in the environmental field, including Chancellor Edward W. Weidner of the University of Wisconsin at Green Bay, accompanied by the vice chancellor of that university, Ray Vlasin. We will also hear from Dr. Clarence Schoenfeld, chairman of the center for environmental communications of the University of Wisconsin at Madison and editor of Environmental Education, and from Dr. Matthew Brennan, director of the Pinchot Institute for Conservation Studies.

The Chair would like to observe how very pleased he is, as are the other members of this subcommittee, particularly the cosponsors of the Environmental Quality Education Act, including the gentleman from New York, Mr. Scheuer, and the gentleman from Idaho, Mr. Hansen, to note the growing involvement of both high school and college students in our country to improve the quality of our environment.

Mr. BRADEMAS. We will begin by calling to testify as a panel Bill Knowland, student at Antioch College; Karen Buxbaum, student at Bethesda-Chevy Chase High School; and William H. Schlesinger, chairman of the environmental studies division at Dartmouth. Please come forward and identify yourselves. Perhaps you would like to proceed in the order in which I have called your names.

STATEMENTS OF BILL KNOWLAND, COORDINATOR, ENVIRONMENTAL STUDIES INFORMATION CENTER, ANTIOCH COLLEGE, PRESIDENT, OHIO STUDENT ENVIRONMENTAL COUNCIL; KAREN BUXBAUM, STUDENT, BETHESDA-CHEVY CHASE HIGH SCHOOL; AND WILLIAM H. SCHLESINGER, CHAIRMAN, ENVIRONMENTAL STUDIES DIVISION, DARTMOUTH COLLEGE; DARTMOUTH OUTING CLUB

Mr. KNOWLAND. If you wish to go in order, I guess you named me first.

Mr. BRADEMAS. Whichever order you would like to proceed is perfectly all right.

Mr. KNOWLAND. I am Bill Knowland, and I am a student at Antioch College. For the past 3 months I have served as coordinator for the Environmental Studies Information Center at Antioch.

To clarify that a bit, I think we could simply say it—the Information Center—serves as the public relations arm of the Environmental Studies Center at Antioch. As such, I have been concerned with the field of environmental education both at Antioch and throughout the country.

Before going into my oral testimony, I would like to note that the testimony copies which you should have, consist of my oral testimony plus some more or less related summaries of reports and proposals of things going on at Antioch which I think you might be interested in as specific suggestions.

Each school, of course, is different, and I can only offer as suggestions what we are doing at Antioch for possible comments and inspiration to others.

First of all, gentlemen, I sincerely hope you realize that you are presently considering what may potentially be one of the most significant and farthest-reaching pieces of legislation you may ever be asked to act upon.

There is little doubt but that we are faced today, in this country and in this world, with an unprecedented ecological crisis. It is a crisis which threatens the life of our Nation as we know it, and perhaps even the very survival of the human species.

The irony is that we have caused this crisis ourselves. We have caused it in two simple ways: first, out of sheer ignorance—out of an amazing lack of factual information about the natural ramifications of what we were and are doing; and, second, even for those things for which we did and do have the facts, an amazing apathy and lack of the will to act properly in the light of those facts.

The problems, then, are a result of lacks in our knowledge and our attitudes. Both are the solid domain of education.

I would therefore submit to you that proper education, particularly proper environmentally related education, is the key to the solution of our environmental crisis. And therefore this bill, or at least the principle behind it, may well make a crucial difference in whether this country and this species will survive.

It is high time that environmental education become a major consideration and emphasis in the curriculums of all levels of education in this country. The Environmental Quality Education Act, H.R. 14753, has been proposed to provide the encouragement and financial support for the development and implementation of some of the necessary programs. Good.

I strongly endorse the bill—but with some cautious reservations.

First, I would personally prefer that it was entitled and meant to be a bill "to authorize the U.S. Commissioner of Education to establish educational programs to encourage understanding of nature's policies—or: natural law—and support of activities designed to enhance environmental quality and maintain ecological balance." By only changing one word in that title, I think we might change the whole significance of the bill and perhaps point up the problem that we are facing in this country.

I am concerned that there is no provision for a permanent staff to supplement the advisory committee. If this bill becomes law and is used to any magnitude, I can well conceive of the advisory committee either working full time or at least needing a permanent staff to maintain continuity and to handle administrative details.

I would also strongly urge that section 5, paragraph (b), of the bill be amended to insure that there is actual student representation on the advisory committee. Leading environmental educators have acknowledged that many students are already well ahead of their professors. I don't think it would be too difficult to find some capable college students already well grounded in the fields of environmental problems and education. I am sure that they would serve as valuable additions to the advisory committee.

Most importantly, I am concerned that this bill's effectiveness will be reduced to nil unless it receives adequate funding. I am not in any position to give you an estimate of what adequate, or even minimal, funding should come to, but I am afraid that whatever the figure, it will be considerably greater than many will feel can be afforded.

To that I can only ask that you gentlemen, if you are or become convinced that this act is vital and necessary, do everything within your power to see that it receives an adequate allocation. I can think of no finer emphasis that could be added to the goals and implications of this bill than if the $275 million already allocated to the SST and the x million dollars, or should I say "billions," aready allocated to the ABM were to be reallocated to the programs of the Environmental Quality Education Act.

I have found striking agreement that a major emphasis of the act's programs should be directed toward teacher and leader training.

Anthropologist Margaret Mead has said that "the waters are rising, and we have no tools to build boats." To that I would hasten to add we have few skilled boatbuilders or sailors, either. Teachers at all levels need desperately not just new environmental knowledge but new teaching attitudes and methods as well.

In closing my oral statement, I would like to suggest one specific program, perhaps to be placed first on the agenda, should the Environmental Quality Education Act be passed and funded.

I propose that the Congress of the United States meet formally in a required joint session lasting a period of at least 1 full week, that session to be devoted solely to the education of the legislative representatives of the people of the United States by acknowledged experts as to the full nature, extent, and implications of our present environmental problems and the alternatives for their actual solution, such session to begin at the earliest possible date. On further thought, I think that may be worth proposing even if the Environmental Quality Education Act is not being considered.

PREPARED STATEMENT OF BILL KNOWLAND, COORDINATOR, ENVIRONMENTAL STUDIES INFORMATION CENTER, ANTIOCH COLLEGE

ENVIRONMENTAL STUDIES CENTER

The Environmental Studies Center at Antioch originated four years ago when concerned faculty and students began to consider their role in dealing with increasing environmental problems. Education, research, and action programs gradually developed. Today, the Center aims (1) to provide a solid background for those students interested in environment-related careers and (2) to develop an informed citizenry, responsive to the pleasures and necessities of their environment, and the problems of maintaining it.

EDUCATION, RESEARCH, ACTION

From the beginning, the program of the Center has included the development of new courses and seminars. The Center is designed to encourage integrated studies across many disciplines as part of a degree program in Environmental Studies. Students from virtually every academic field are represented, and there are faculty from biology, chemistry, physics, geology, engineering, geography, sociology, anthropology, history, economics, philosophy, education, drama, and the visual arts. Associated with them are members of the Antioch Outdoor Education Center, the Glen Helen office, the Extramural Department, and interested graduate students. In addition to regular classes, special evening seminars have been arranged, which the public is encouraged to attend. The development of an Information Center, as a clearinghouse for information about local, regional, and national, environmental activities, is becoming an important contribution of the Center.

Research at the local level is focused on the campus and village, on Glen Helen, the College's thousand acre nature preserve, and the Little Miami River and its valley. Research further afield has included studies of the Green River in Utah, urban problems in Philadelphia, and foreign studies in Africa, Mexico, England, and Switzerland. Many opportunities for research are presented on co-op jobs, the work portion of Antioch's work-study program.

Education, research, and direct *real* action are integral parts of the work program. Students get to learn by actually doing in off-campus work experience comprising approximately half of their Antioch education. Among the ever-increasing diversity of co-operating employers are:

U.S. Forest Service, Berea, Kentucky
University of Connecticut, Institute of Marine Science
Jackson Laboratory, Bar Harbor, Maine
Metropolitan Washington Planning & Housing
National Park Service
N.Y. City Parks, Recreation & Cultural Affairs Administration
Delaware Valley Regional Planning Commission, Phila.
U.S. Geological Survey, Menlo Park, California
Ontioch College, Trailside Museum, Yellow Springs, Ohio
Osborne & Stewart (architects & landscape architects), San Francisco, California

Academy of Natural Sciences, Philadelphia, Pa.
Baltimore Planning Commission
California State Department of Public Health, Berkeley
Cleveland Heights Outdoor School Camp
Citizens for Clean Air, New York City
New Haven Redevelopment Agency
Planned Parenthood
Population Curriculum Study Project, University of Delaware
University of Georgia Marine Institute, Sapelo Island
Harvard University, Arnold Arboretum
National Audubon Society
S.U.N.Y. Ashokan Field Campus, Kingston, New York
Raytheon Marine Research Laboratory, New London, Conn.
Scripps Institute of Oceanography, La Jolla, California

The Environmental Studies Center is constantly developing, innovating, and trying to respond to the needs of modern environmental education.

For further information contact: Environmental Studies Information Center, Antioch College, Yellow Springs, Ohio, 45387 or Prof. Robert Riett, Chairman, ESC, Antioch College, Yellow Springs, Ohio, 45387.

ANTIOCH COLLEGE SCIENCE INSTITUTE

At least partially because of the Environmental Studies Center's existence, originally as an informal group of concerned students and faculty, the entire science department at Antioch has begun a reorganization into the Antioch Science Institute. The traditional barriers of the science disciplines are being replaced by four interdisciplinary centers—centers for General Studies, Teacher Education, Training in Research Methods, and Environmental Studies. Such a move has been deemed necessary not merely as a gimmick for reversing the drain of students away from the physical sciences, but more importantly to open new avenues of problem-oriented education, research, and action as ways to make some real and immediate contributions to our world's pressing socio-scientific problems.

Survival House: A Modest Proposal

The proposed Survival House would be composed of approximately twenty students committed to understanding and, insofar as possible, acting upon the critical problems related to the phenomenal growth of the human population. The focus would be primarily environmental; it would center upon the man-made agricultural, industrial, and urban disruptions which endanger the stability of the biosphere and the survival of the human species.

Survival House would be committed to the educational ideals of freedom, exploration, and relevance. Students would live together in a house which, besides having wonderous green things growing, would have a library of relevant books and periodicals. Students would be expected to devote two-thirds of their time to house activities. These activities would include reading, discussions, dinners, and the maintenance of the house as well as research projects and the presentation of vital information to the college community.

The two "academic" requirements for the quarter would be an annotated bibliograph of all publications discovered (at the House, the college library, Fels and Kettering Labs, or elsewhere) and, most important, a list of all the questions which reading, thinking, talking, and living at Survival House provoke.

Every few days a "central coordinator of questions" would assemble the students for a review of questions. Collectively they would attempt to answer them and to recommend sources of further information. The coordinator would then select questions which have not been fully answered by the group and which are of general interest and relevance. These questions would be taken to faculty liaisons and other resource people who would be asked to come to the house and there discuss the "answers" and/or the implications, processes, and factors which the questions suggest. From these questioning confrontations some understanding should come; certainly there will be more questions.

In addition, everyone in the house will be expected to take some *action*. There are many possibilities, including preparing presentations and publications for the college and other communities, writing letters to organizations and schools to find out what they are doing and how they can be helped, writing letters to legislators, attending area pollution control conferences, experimenting with organic gardening, and working on the Environmental Studies Center library.

Survival House will also search for co-op jobs with public health programs, conservation clubs, air and water pollution control laboratories, birth control programs, and agricultural institutes. During on and off-campus quarters, then, Survival House will search for ways in which the members of an academic community can serve as the catalyst and the work force for a changing society.

REGIONAL EFFECTS OF THE ENVIRONMENTAL EDUCATION PROGRAM AT ANTIOCH'S GLEN HELEN

Report to the First Annual Biological Meeting of the Miami Valley Project, Kenneth W. Hunt, March 22, 1969:

I note that one of the objectives of the Miami Valley Project is to identify any "trigger" factors which may be modifying the man-environment relationship here. One quite strategic factor is anything that changes the public attitude toward environmental education.

Since 1929, Antioch College has been engaged in environmental education through the activities conducted in its Nature Reserve, Glen Helen. I will report to you what these activities have been, and will suggest how these may have influenced environmental relationships in Southwest Ohio.

Glen Helen is adjacent to Yellow Springs in the upper Little Miami Valley. It has 1000 acres, of which about one quarter are of old-growth forest, relatively undisturbed, where one can glimpse the biota as it originally existed in southwest Ohio. Other parts of Glen Helen are former farm fields and pastures where the process of biotic succession can be observed or manipulated. In some 100 acres we have prevented the process of succession by continuing farming operations, thus keeping some options open for the future. Recently 10 acres were subtracted from the farm and added to an experimental prairie, and another 40 acres are being converted to a wildlife study area by our Outdoor Education Center.

Now I shall review the environmental education services of Glen Helen chronologically, with comments about possible regional effects.

Nature trails

Since 1929 we have maintained trails in Glen Helen, open to the public. A census we took over the two-month period of April and May in 1967 showed over 17,000 visits. Over two-thirds of our visitors come from outside of Antioch College and Yellow Springs. It is likely that many of these people would welcome more open space resources for their own communities.

Yellow Springs school forest

In 1937 we arranged for the Yellow Springs High School to have the use of 100 acres of former farm land in Glen Helen as a School Forest. The school began an annual program of Christmas tree plantings. This led to the annual Christmas Tree Festival, when families select and cut their own trees and pay the school. This was the first School Forest to be recognized and [illegible] by the Ohio Forestry Association, in 1938. [illegible] for teachers were sponsored here. Now there are about 100 School Forests and [illegible] developed in Ohio. Of course the School Forest in Glen Helen is not the whole reason for all this, but we know it had impact.

Outdoor education conference

In May, 1939, an enthusiastic group of our students organized a week-end Outdoor Education Conference for teachers and youth leaders in Southwest Ohio. This has been an annual event ever since; altogether over 1000 persons have attended the 30 conferences in Glen Helen. Perhaps some of you have been among them. These people have carried back to their communities the result of their discussions and experiences about nature interpretation, conservation and environmental problems.

Trailside museum

In 1951 we built our Trailside Museum, to serve as the Gateway to the Glen. [illegible]

Nature Centers were new when we built our Trailside Museum. We were preceded in Southwest Ohio by the Burnet Woods Museum in Cincinnati and we were preceded by the development of the present Dayton Museum of Natural History. We are indebted to both of these for ideas and inspiration. In 1958 the National Audubon Society asked me if it would seem competitive if they set up a Nature Center at Aullwood. I told them we need it—that such Nature Center would stimulate more. The newest now is the Cincinnati Nature Center. Not that we can say who caused it—but for years some of the sponsors of the Cincinnati Nature Center have been visiting the facilities of their predecessors!

Outdoor Education Center

It is good if children can spend a few hours in the woods, but it is better if they can come for a few days. After years of struggling for ways and means, we finally built the Outdoor Education Center in Glen Helen in 1956. This is a residential facility for school classes, for teacher education, for workshops and conferences. It receives around 2000 school children annually, coming from Cincinnati and Columbus and points between. In addition many church and other youth groups schedule weekend retreats and workshops here. Our staff conducts a thorough-going program of environmental education for the children. The conferences that have been scheduled here include the Outdoor Science Section of the Ohio Education Association, the Nature School of the Ohio Association of Garden Clubs, the Intercollegiate Outdoor Education Conference, and many others. In the summers it has hosted the Ohio Conservation Laboratory and the Miami-Antioch Outdoor Education Workshop for Teachers.

The real pay-off comes when some of the teachers and some of the schools that have used our Outdoor Education Center create Outdoor Schools of their own. Several suburban Cincinnati schools, which used to come to Glen Helen, such as [illegible], now operate their own program at Camp Kern. The Centerville Board of Education has designed and built outdoor education facilities on their own property. The [illegible] schools, north of Columbus, do school camping at the 4-H Camp Ohio. Both Centerville and [illegible] teachers had attended Glen Helen workshops.

The credit for this vigorous growth of our outdoor education service for schools belongs to Mrs. Jean Sanford Replinger, who developed and directed our Center for ten years until her marriage two years ago.

Riding Center

In 1957, eighty acres of former farm land in Glen Helen were leased for a program of horseback riding called the Riding Center, and a bridle trail was routed through a second-growth region of the Glen. Now there are three riding academies in the vicinity of Yellow Springs, and the Village's Open Space Plan envisions bridle paths ringing the town.

Fighting off encroachment threats

During 1957 and 1958 Glen Helen was more severely tested than at any other time in [illegible]

[illegible]

[illegible]

to all the people that had attended our conference, and to biological and conservation and nature societies. Some of you here, I'm sure, remember writing letters on our behalf. Finally Governor O'Neill, and then his successor, Gov. Di Salle, each wrote assurance that another route would be found.

Nor was this our only struggle. Overlapping this, in 1959 and '60, we had to contend with engineering recommendations that a sewer trunk line and disposal plant be located in the forested valley of the Glen. Finally this alternative location was found outside.

The Glen Helen Association

These successes were hard-won, but they accomplished a great amount of publicity and education about the values of natural areas. Moreover, they left us with a large and enthusiastic body of supporters, who in 1960 organized themselves into the Glen Helen Association. The purposes of the Association are to protect Glen Helen, to promote the idea of community natural areas, and to generally advance ecologic education. It raises funds to strengthen the educational services in Glen Helen, and it sponsors an annual public lecture which has featured such conservationists Karl Maslowski, Stanley Cain, Harry Caudill and Charles Mohr.

The country common

We are fortunate that adjacent to Glen Helen is John Bryan State Park. Together we preserve 1500 acres in the upper Little Miami Valley, and this has attracted other outdoor agencies to our region. Within the park now are a 4-H camp and a State orphan's home camp. The Boy Scouts and the Girl Scouts bought land for camps adjacent to the Park. The Nature Conservancy raised the money to buy Clifton Gorge and then gave that splendid scenic and scientific preserve to the State. The Village of Yellow Springs has acquired land north and south of Glen Helen as increments toward a future green belt encircling the community. All these open space landowners have since 1962 been associated as a Committee for a Country Common, committed to the purpose of [illegible] the permanent open space [illegible] and of cooperating to help each other achieve the best protection and the best use of this beautiful region. A recent film produced by the U. S. Department of Housing and Urban Development includes the Country Common as one of the methods of saving open space before urbanization takes over.

[illegible]

To speak of a "trigger factor" that may be altering environmental relationships in Southwest Ohio is a rather ambitious [illegible]

[illegible]

[illegible]

[illegible]

One final example in testimony of this gathering momentum is the announcement by the Ohio Department of Natural Resources of its plan to designate the Little Miami as a Scenic River. Many conservation interests have cooperated through Little Miami, Inc., to support this purpose. I think this means that two very significant principles are becoming recognized. One is aesthetic: that government has a responsibility to safeguard important scenic resources. The other is practical: that flood plains are excellent and low-cost sites for nature and recreation, and on the other hand are dangerous and extravagantly costly sites for development, after all the expenses of protection are reckoned.

The research programs which our colleagues are reporting today reveal a wide variety of significant factors for the Miami Valley Project. The educational factor which I have described is helping to establish a psychological environment in which your scientific work can thrive. We have made this education our business in Glen Helen, and we are greatly relieved to realize that at long last we are but one of many centers of environmental education.

Mr. BRADEMAS. Thank you very much. Could we next hear from Miss Buxbaum and then Mr. Schlesinger, and then we will put questions to all of you.

Miss BUXBAUM. The environmental crisis that now confronts us is the result of an ecologically unsound attitude toward life. This attitude has its source somewhere in the educational process. The remedy of the problem, however, also lies in the educational process.

Because formal education begins in elementary schools, environmental awareness should be introduced here along with reading and arithmetic. Montgomery County has the outdoor education program, which is now in its 7th year. It presently involves more than 60 schools and 5,000 children. This week the program is expanding into a junior high school as a pilot program. I have brought copies of the superintendent's report to parents with me for those of you who would like to take a look at it. It was issued about 3 or 4 weeks ago to the parents and faculty within Montgomery County.

In brief, the outdoor education program deals with what might be called experimental learning, based on the premise that kids learn from doing. It involves active learning rather than passive classroom listening. At present, the children spend a week at one of three rented rural sites with the principal, classroom teachers, student teachers, and high school students, or adults from the community who are interested in the program.

They learn forestry, astronomy, biology, map and compass study, and more. Ecology is usually taken up late in the week, for it is the terminal of all the other disciplines. As Joe Howard, the curriculum supervisor, says, "This is what ecology is all about. We can talk about man's abuse of his environment, but you don't get a real feeling for it in a classroom."

Unfortunately, each student must pay approximately $10 for the outing, and the rented sites are not well enough equipped to allow optimal use of the valuable time during which the kids are living their education. The 1971 Capital budget requests $295,000 for construction of a properly equipped facility on a 63-acre site in Rock Creek Regional Park. Also requested is nearly $60,000 for the cost of the land. This facility would be used for inservice training of teachers as well as a spot for the weeklong outings.

I question how long 63 acres of land will survive constant use by a county full of children and teachers. It seems faulty to spend such money and effort on a project with built-in obsolescence when a larger tract of land would surely have a longer relative life span. Use of any particular part of the land would be minimized and therefore less damaging. But the land is expensive.

Unlike many educational ventures, this outdoor education program could conceivably be expanded to accommodate students of all ages in the public school system if there were adequate facilities and educators. It takes money to prepare both commodities. Sites need to be acquired and teachers need to be trained.

But the teachers on the high school level need not be trained independently of the students. Our communities have many specialists in pertinent disciplines both in higher education as professors and researchers and in such institutions as the Park Service, the Smithsonian Institution, and private industry. City planners and architects would have a significant teaching role in many communities because of their proximity to the city.

Curriculum planning would have to be indigenous to the individual school. Once teachers were trained, they could perpetuate and improve their programs. Once high school students were trained, they could contribute to the efforts with primary school children. This would be a great help to the two student groups, for the high school kids would learn about communication with younger children and at the same time be compelled to understand more fully their subject. The younger children might grasp some concepts more fully as presented by an older student rather than a teacher.

The cooperative effort of student teachers and elementary educators would compel the participants to shelve their famous generation gap for the duration of the partnership in education. Chances are that it would never be brought back out of storage.

The time when high school students would do their teaching could conceivably be during the second half of their senior year. Most high school seniors will agree that secondary education lasts 5 months too long, for the end of the first semester is the point of diminishing returns. Senior slump sets in and production drops to drastically low levels.

Teaching need not be the only project of these second-semester seniors. This could be a time during which those interested students could choose to work in some other capacity than classroom listener and thereby further enrich their education. Second semester might become a time for liberal planning to encourage independent endeavor by the student—a kind of work-study program.

Graduation of seniors signals the big kick into the clutches of that mystical beast the real world without any idea of what to expect. Senior projects could be an intermediate step between the all too sheltering high school and the unnecessarily threatening real world.

Within the existing framework of high school academics, there are two aspects to environmental education. The first involves a general exposure that all Americans should have to the crisis we are now facing. This type of general exposure could well be incorporated into the social studies courses such as problems of the 20th century, sociology, and economics as they now exist. Because it is an attitudinal problem being dealt with, it conveniently fits into the framework of courses that study social trends due to economic, political, and historical conditions.

The other aspect of environmental education switches from the social to the scientific. It is in the scientific approach that the word "ecology" becomes meaningful and in the biological analysis that one gains insight into the intricacy of our ecological balances. This more specific instruction is where the excitement and long term challenge enter, but it is also the more difficult of the two sides to expose skillfully and accurately.

Students and educators must feel a commitment to environmental course work for the subject to come alive and be more than academic book learning. Ecology does, indeed, involve a voluminous amount of bookwork, but it must also become a way of life to be meaningful. Instructors of ecology, the science, must be specialists. We do not yet have enough ecologists to go around.

This is the point in my testimony where I shall bring in my experience last summer. I lived ecology for 5 weeks under the subsidy of a National Science Foundation summer study grant in Nevada. It was at Foresta Institute of Ocean and Mountain Studies.

Our purpose was to learn. The course material was rigorous, stimulating, and challenging. For the first 3 weeks, we had an hour of chores, several hours of lectures, about 5 hours of field research, and several hours of field data reduction each day. On several evenings, we had lectures by our Czechoslovakian and Chilean guest botanist-ecologists. Several nights we slept out in the field, gathering further microclimate data and trapping and observing the nocturnal mammals. Our schedules were always full, so there could be no tardiness or procrastination.

After this first period of acquiring a background in ecological principles and of learning to think scientifically, we all moved up to a large isolated estate on the shore of Lake Tahoe. Here new disciplines were added to the old. Here we acted for 10 days as individuals on original research projects. We worked apart, slept apart, and most often ate apart. Our instruments for investigation were simple and often self-designed and self-constructed. I learned about hearing, seeing, tasting, and feeling when I was alone on these several days.

And the staff was extraordinary. They were truly teachers. Each of them was a knowledgeable teacher in the classroom; each lived, worked, and learned with us, contributing equally to our Foresta community.

This 5 weeks of study was a total learning experience. I discovered things, made instruments, labored hard to learn my subject. The challenges became surmountable; the human relationships grew precious and permanent; and the academics were different from anything I had ever encountered in school.

Ecology came alive for me in Nevada because it became a way of life. For 5 weeks I was totally immersed in environmental awareness. An incredible amount of time was spent in our small library and lab, but the academics seemed incidental. The outside was always there on the other side of the door, waiting for me to explore it. It imposed no restrictions except that I respect it—as I did. There was a profound sharing there, for as nature gave me the priceless experience of finding my ecological niche in her system, I promised to return the gift by means of that knowledge. I plan to be an ecologist. Before this summer, I felt no inclination toward science.

My experience was too exceptional. Although subsidized by the National Science Foundation, it was an expensive summer. Because scientific research appropriations have been cut, even this program has been discontinued.

Summer school, although it, too, would not reach many people, could provide the setting for programs based on this type of living the subject that I have just described. The effort would need money, flexibility, and specialists—all of which are presently lacking.

Education, general as well as environmental, must be made to come alive outside the classroom. If your textbook is the world, you always have a ready source of reference available. It should not be such a rare phenomenon that an individual find environmental understanding and awareness. One should not have to search outside of the public school system for the kind of experience that I was fortunate enough to have. It must be right there for the asking.

Mr. BRADEMAS. Thank you very much, Miss Buxbaum.

Our third member of this panel is William Schlesinger.

Mr. SCHLESINGER. Yes, I am chairman of the environmental studies division of the Dartmouth Outing Club. I will present a written statement and a copy of a pamphlet on the CCIS, University School, summer science project, and what I would like to do here is present a short summary of that statement and some of my experiences.

At a time when many of us are inundated with information on the environmental crisis—pollution, population, and man's survival—and in a time when we see high schools and colleges across the Nation are busy organizing an actional and educational Earth Day, April 22, it is important to consider the possible impact and value of environmental education should it become a permanent part of the U.S. educational system.

I notice a copy of the bill outlines a short history of environmental education, and we can say rightly that until recently it has been almost totally the responsibility of natural history museums and conservation groups who have privately funded and carried out environmental education programs on their own.

Recently, due to the shortage of private foundation funding, many of these programs have become oriented toward teacher training, feeling this is an appropriate way to get a more favorable student-cost ratio.

But seeing this history and seeing the crisis before us, we should take a look at the value of environmental education, and I think the previous two witnesses have pointed out some good examples of the value of environmental education in a child's education.

First of all, looking at the elementary school level, as it has been often said, very early in a child's education at an elementary or junior high school level, he receives a spark of motivation which guides him through further education or a career in a particular field. I think this is often true with environmental education, and many times I have seen students, junior high school age or younger, particularly, in the university school program in Cleveland, get a spark of motivation which pushes them on to further education in the environmental field, and many of them now are beginning to enter careers in it.

At the higher educational levels, I think we can look to environmental education supplying students with awareness of the environmental crisis just by exposure to enviromental education. I think that with these students, it is essential, and that we need a new generation of environmentally aware public if those directly at work on the problem are to succeed in solving the crisis.

We are going to have to have a general citizenry that knows what the environmental crisis is. This is not present now, and it is a primary problem of people directly working toward the environmental improvement problems as they are faced with them, and for the general public to be aware of many of the problems and causes.

So I think environmental education at higher levels—high school and college—will hit a large number of students with this awareness, students that maybe have already gotten the motivational punch from their elementary school level education, or maybe they haven't, but at any rate it will supply a general awareness of the problem.

Then we can look at the best approach we might take to environmental education. I think the Environmental Quality Education Act is well rounded in this respect. There are three main ways I have heard expressed for environmental education. One is that privately managed programs which are currently being run should be expanded and increased and these would successfully handle the problem. Secondly, I believe that students will motivate other students through such activities as the Earth Day, and thirdly, the primary way of increasing environmental education which the bill here proposes is that a combination of teacher training, equipment funding, and organized school programs in environmental studies be organized and funded publicly.

I feel this is highly important, particularly teacher-training, because teacher training is essential to the organization of any environmental education program now and they are very short in supply. Teacher training, as I pointed out, is financially many times the preferred method of carrying out the organization of environmental education because it does lower the per-student cost of such a program when one considers that each teacher will reach many students during his lifetime after being trained in a special program. However, trained teachers are of little use unless they have equipment, funding, and curricula which is offered in the schools and has been written up so they can use it.

Again, I think the bill has good proposals here for the writing of this so the teachers can get started in their schools after they are trained. Again, I think that publications and other channels of communication are needed between schools and teachers. And many times I have seen a duplication of effort around the country because of the lack of this kind of information communication.

I would like to see teacher training remain the responsibility of private programs only, but instead of having private foundation funding, I would like to have the public funding go to these private programs.

Thus, seeing history and the value and approaches to environmental education, we can see that many of the provisions in the Environmental Quality Education Act are well equipped to handle the problem as I have summarized it here. I think that this is a good way to get a proliferation of environmental awareness in training and in attempting to solve the crisis today.

PREPARED STATEMENT OF WILLIAM H. SCHLESINGER, CHAIRMAN, ENVIRONMENTAL STUDIES DIVISION, DARTMOUTH OUTING CLUB

It is a pleasure to be here today to describe some of my past activities and thoughts in the field of environmental education for the upcoming and timely Environmental Quality Education Act. In a time when many of us are inundated with information on the environmental crisis—pollution, population and man's survival—and in a time when we see high schools and colleges across the nation are busy organizing an actional and educational Earth Day, April 22, it is important to consider the possible impact and value of environmental education should it become a permanent part of the United States educational system.

The idea of environmental education is not a new one, and perhaps we should first outline its history. Until recently, environmental education has primarily been the responsibility of natural history museums and conservation groups who have privately funded and offered programs for students, particularly high school age and younger, to participate in on an extracurricular basis. These programs have for the most part been excellent and have recently been joined by similar offerings by colleges and independent schools. Funded by themselves or private foundations, these groups have seen the need for more programs of the type which the museums and conservation groups had originated. One such program in which I worked is the Summer Science Project offered to junior high school students mixed from the innercity and suburbs and sponsored by Cleveland, Ohio's University School and by the Cleveland Foundation. Like many other secondary school special programs, it has depended almost entirely on a private foundations grant in its three summers of existence. Like many others it has found a large and exponentially increasing number of students and teachers interested in participating and at the same time funding increasingly difficult to obtain.

The demand for more programs of this type and other civic projects has placed a phenomenal financial pressure on most private foundations. Thus, seeing the need for environmental education, many of these programs and their sponsoring foundations have oriented themselves towards teacher training programs in order to obtain a more favorable student-cost ratio theorizing that each teacher reaches many students. The summer training workshops in environmental education offered by Tilton School in Tilton, New Hampshire for high school teachers are leaders in this field. Whatever their success and scope, most existing programs are doomed to reaching only a very limited audience and to continually facing financial difficulties—precisely at a time when environmental education should be widespread and greatly stressed.

Having such an outline of the history and some of the problems, let us examine the value, purpose, and goals, both immediate and long range, of such environmental education. It is often said that very early in a child's education—sometime in elementary or junior high school—a child often receives a spark of motivation which provides the impetus for his further education and/or career in a particular field. I think this is often true with environmental education. Many times I have seen students, junior high school and younger, follow this pattern. The Summer Science Project by University School and the Future Scientist's Program by the Cleveland Museum of Natural History have provided many such students. From a long range viewpoint, environmental education at an early age level will provide the many individuals in the many fields of environmental work which will be needed now and in the future to deal with the environmental crisis.

However, environmental education need not stop with early educational levels. Many students who miss the early motivational spark may well obtain it later in their education. Even if they never obtain it and enter careers other than those directly connected with the environment, the environmental awareness created by an exposure to environmental education will also be necessary if the crisis is to be solved. Indeed, the majority of students will probably never be directly involved with environmental work during their lives. However, they will be living in the environment, using its resources, contributing to its [illegible] and populating it. A new generation of an environmentally aware public will be necessary if those directly at work on the problem are to succeed in solving it. These citizens are the ones who will have to understand, accept and live by the new environmental ethic: [illegible] the reasons for [illegible] population growth, the effects of [illegible], economics and the use of certain products. Environmental education will probably serve its greatest function at the later educational levels creating this awareness and ethic in students and future citizens as they [illegible] lead an informed and understanding life. Thus, together with its great need for providing the spark of motivation for future careers in environmental fields, environmental education is greatly needed for the creating of a new generation of environmentally informed general citizens.

The best approach to the initiation or strengthening of environmental education is highly debatable. Few maintain that the existing offerings and programs are enough to supply the demand for an informed citizenry and the demand for career workers. Some do maintain, however, that the privately managed special programs should be expanded and increased and that these would successfully handle the problem. Some believe that motivated students will motivate and make aware more students through such self organized efforts as the April 22nd Earth Day. The majority of educators believe that a combination of teacher training equipment funding and organized school programs in environmental studies is the solution to the question of approach to environmental education. I can see a place for all three facets; however, I firmly believe that the first two will continue their present programs and effectiveness and that we must initiate and/or strengthen the last as our approach. I feel the demand and urgent need for environmental education outstrips the resources, finances and energy of the two former alternatives although they should definitely be continued in conjuction with newly organized school programs. I feel that the broad based Environmental Quality Education Act is well equipped to fulfill the third alternative approach of training, equipment funding and organized programs.

Let us examine the needed program in more detail. The need for teacher training is obvious and is necessary before any of the other is feasible. It is financially expedient for it *does* significantly lower the per student cost of any program as each trained teacher will reach many students in his teaching. Teacher training is now offered largely by special privately funded programs outside of school systems. I feel this is a successful approach and that teacher training should be continued by this type of program with recognition and accreditation by school systems. Funding has presented the major problem to this approach and has severely limited the number of this type of program in existence. Therefore, I think it is a high priority item that funding be removed from the responsibility of private foundations. Only then can the number of existing teacher training programs be increased and all the training that is needed be offered.

However, trained teachers are of little use unless schools have a definite course offering or curricula in environmental studies which reaches all levels of students. Many independent secondary schools have made such courses available, but the majority of public schools at all levels have no such program. Exemplary programs are offered at Tilton School and University School in their regular school year in environmental studies and sciences. They have the increased benefit of being an integrated type of discipline calling for the student to make use of knowledge of many fields to solve problems. Equipment funding is intricately tied into the problem at this point, for most schools have no extra finances for the curriculum writing or the teaching equipment needed for the initiation of environmental studies. Needs for effective communications of ideas and information are also great and are lacking at the present time. To prevent needless duplication of efforts such channels and publications for teachers and schools need to be developed.

We have thus briefly seen the history, problems, value, purpose and needed new approaches to environmental education now and in the future. Many of the problems and approach solutions are the same for various educational levels. Environmental education is needed on a multi-level basis as we have seen also. I feel that governmental financial support and stimulation is essential for training, equipment purchasing, the acceptance and proliferation of environmental curricula in schools and for the effective dispersal of ideas and information. The Environmental Quality Education Act is well equipped to cover these areas of need.

Mr. Brademas. Thank you very much, Mr. Schlesinger, and let me express my appreciation to all three of you for very useful statements.

Let me ask a few questions and any or all of you may wish to comment on them. One of the questions that comes up in talking to the press and to our constituents in our several districts is this: Does the sudden increase in interest—sudden, over the last year or so—on the part of high school and college students in the environmental crisis mean that there will be less interest in the issues of Vietnam and civil rights, which is a question I am sure has been put to you—by the smiles on your faces—many times?

A companion question I might ask is this: Are the same students involved in the environmental teach-in those who would customarily be involved in these other areas of activity?

Mr. **Knowland.** I can remember those reports coming back from as far as November, and it is utterly fantastic that anyone could even conceive that students can either—well, if it were two separate issues, not concentrate on two issues at once; but the whole point is that the war, the racism, urban problems, are not separate problems apart from ecology but they are very much a part of ecology. Ecology is sort of an overall view, the overall problem, and no real progress will be made in ecology until progress is also made on those other fronts, and I think that any students who have gotten into the problem realize this and unfortunately many of the students who were already deeply involved with the war, racism, et cetera, before, are slow to catch on to the broad overview, and there has been some trouble with those people feeling that attention might be taken away.

But I think in regard to students being different who are being drawn into the ecology movement, if you want to call it that, yes, they are different. There are a lot more of them, but they are also being drawn in by virtue of the interrelatedness of everything else into those other movements, so in the long run I think all will gain strength.

Mr. **Brademas.** I noted, Miss Birnbaum, in your statement, you observe that we ought to bring environmental education into our systems of learning in both the primary and secondary levels because it is in those levels that one's life style is in large measure determined and shaped.

I wonder, your having used that phrase, if you and your colleagues could tell us to what extent your own life styles have, in effect, been changed since you have made a commitment to concerning yourselves in the environment.

Mr. **Scheuer.** Have you stopped driving a car?

Miss **Birnbaum.** As much as possible. Any errands near home, I ride a bicycle or walk.

Mr. **Scheuer.** Do you use an electric hairdryer?

Miss **Birnbaum.** No, sir; I don't have enough hair. I live about a mile and a half or 2 miles from school, and my school bus is one block away, and we have—well, starting about a month ago, I have been walking or riding my bicycle to school, and all during the fall I did also rather than take the bus.

You know, this does not stop the buses from running; it is a token gesture on my part. We had a petition going at school for the purpose for students to walk rather than use automobiles or buses for transportation to school, so that they have a foundation upon which to ask other people to change their life styles. If I can walk a mile and a half through the rain to school, then I can ask someone else to use glass milk bottles instead of milk cartons and to recycle paper, this kind of thing.

I suppose that the major change in my life since my involvement in ecology is, I really seriously intend to be an ecologist. All of my college plans I made, my applications and everything, have centered around the fact that I want to major in biology so I can be an ecologist, and I really don't think I am going to be easily swayed from this goal.

I don't know how much more of one's life one can devote—all of college and supposedly a career in a subject. As far as the little things, such as littering——

Mr. SCHEUER. Did you say "little things"?

Miss [illegible]. "Littering" is the way the problem is approached in elementary schools now. Kids go out and pick up paper but that is such a superficial part of the problem. It is not papers, gum wrappers, and candy wrappers around in the parks that is the problem but it is big industrial problems, mass transit problems, this kind of thing, which is really the essence of the problem, not litter.

So I don't throw litter. But that was before this environmental campaign. At my house, we have as of yesterday stopped using disposable milk cartons and have gone back to using the bottles that can be reused.

Mr. SCHEUER. What happens to those bottles in the average urban family once they leave the kitchen? Do you have any idea what the recycling process is for bottles in the average urban family?

Miss [illegible]. The bottles that are returned to the milk companies and to the bottling companies, from everything I have ever been told, are recycled, each bottle, about 15 or 20 times, and they are sterilized and refilled for circulation, and then after they have fulfilled their life span, which is about 20 usages, they are disposed of.

Mr. [illegible]. If I can interject, the whole thing, the whole system in the country, whatever word I have to use, is set up against any sort of real, valuable, personal eco-action. That is fine; we can recirculate milk bottles, and it is a good, necessary thing, and it is certainly better than using milk cartons, because the bottles can be reused and can be recycled, and even after outliving their usefulness, they can be broken down and used again and be made into other bottles or jars, whereas milk cartons, when they are burned, cause air pollution and whatever.

The ideal thing would be for people like myself to head off for the backwoods and live on our own there and do things toward cleaning up our own systems, as it would be called. But can you perceive of 200 million people in this country today leaving the cities and heading off for the woods? It is certainly probably true if there were 200 million Indians living in this country today, there would be far more ecological damage being caused—well, I won't say that, but there would be a considerable amount of ecological damage being caused by them as well.

It is a matter of people and it is a matter of especially a highly technologized society such as we developed, and I am not saying a technologized society has to be that way, but with such as we have now, any personal eco-action will not make any significant amount of difference until it is on such a scale it either forces the system to change or the system changes of its own accord.

Mr. BRADEMAS. Let me put a question to you, Mr. Schlesinger, a pair of questions, and then yield to my colleagues for further questions.

With the testimony that we have had in the 2 days of hearings and the material that has been made available to our subcommittee so far, and from what one generally observes, it seems very clear that the whole problem, as Mr. Knowland has just suggested, of coping with the dangers to our environment is more complicated, more difficult than at first blush may appear.

One wonders, therefore, how much patience one can expect on the part of high school and university students who have committed themselves to this concern, and I would ask you if you could give us any indication of what, at Dartmouth College, for example, where you are leading the environmental teach-in, or elsewhere in the country, plans are being made by the college students to follow through on the April 22 teach-in.

Mr. **Schlesinger**. I think at Dartmouth maybe we are less active than some of the other campuses, but to start off with, we have a workshop for the 22d on household ecology, and it is going to hit on many of the things we have talked about already here.

I think many of the students will and have expressed an interest in going back to their communities over the summer and organizing a similar type of pamphlet, spreading of information, and dispersal type of program, and at the campus itself in May we have already planned for further activities up in the White Mountain National Forest and, for example, a program is proposed for May 15 to encourage vacationists to supposedly all "pack out what they pack in" so that they leave the woods up there in the same condition as they found it.

I do have a feeling, and I think a lot of people have expressed it, that perhaps things may quiet down after the 22d. This is a very real worry. But I also have a feeling that if the programs on the 22d come off well at many colleges around the country, that they will not die out afterwards. I think that many students will get fired up on this and continue in it.

Right now it is questionable when somebody looks at it from the outside, because this is the first time something has been done. Many, many good ideas have been expressed and many professors are throwing their ideas out and helping out in this. It is a question to see if this issue will hold the interest of students as much as the others. I think it will, but I would like to wait until April 23 and beyond to say.

Mr. **Brademas**. I have many more questions I would like to put to you, but I want my colleagues to have a chance to ask questions, as we have other witnesses.

Mr. Bell of California.

Mr. **Bell**. Thank you, Mr. Chairman. We heard testimony in Los Angeles not long ago by Dr. Libby of UCLA in which he commented that he believed we should establish a school system for ecology resembling medical school, in which a student would study to be an ecologist and would be graduated like a doctor and then pursue this endeavor either with the Government or with some other industry or whatever. What is your view of an educational system, or graduate school like this? Does it appeal to you? You mentioned, or the young lady mentioned, a minute ago, that she would like to be an ecologist, and I was wondering if this is the approach you would like to take.

Miss **Buxbaum**. An ecologist doesn't become an ecologist until years and years of being a scientist. The men who were my instructors in

Nevada were biologists and it was not until they studied for years and years that they felt they could call themselves ecologists, because it is a matter of experience and wisdom that you gain through understanding all of the interrelationships.

Ecology is a very hypothetical thing. You can't have someone sit down and teach you ecology. It is a thing you have to experience, you have to become a part of it, it has to become a part of you, some of it you have to sense intuitively, every situation is new in every interrelationship you encounter.

If you have a factory, a stream, and road here, nobody could have taught you anywhere in your education exactly what is going to happen in that system. You have to have been taught how to analyze that system; so it is different from a very rigidly factualized study such as I presume a lot of medical work is. You can major at some universities in ecology. I know at Cornell University they have a graduate school within their biology department for ecology and systematic majors,

So, are you talking about just a standard graduate program?

Mr. **Bell.** Yes; a graduate program like medicine or law or anything else. I gather, though, from your comments, that you feel you can't learn very much by a regular study course.

Miss **Buxbaum.** Well, you can learn a lot but you can't learn to be a real ecologist the way—well, it is such an experimental thing.

Mr. **Bell.** We must recognize there are many facets to ecology.

Miss **Buxbaum.** Yes.

Mr. **Bell.** And there are, of course, many problems that have to be solved and they have to be solved sometimes quite scientifically because they are very complicated.

Miss **Buxbaum.** Yes, sir.

Mr. **Bell.** Would you like to comment?

Mr. **Knowland.** I would. Ecology has very quickly become such an all-encompassing thing, but I think we can break it down into two fairly distinct types of meanings for education at any rate. No. 1, for general education purposes, ecology is more of an attitude perhaps than a body of fact that you need to know. This is what we need to instill the general citizenry with. Also, there is a very definite and crying need for what you're asking—for technical ecologists, as it were.

There are some good programs, some good graduate programs already in existence around the country—Cornell, Michigan, Stanford—but much more is needed.

I think such things as John Fisher suggested in his article in Harper's magazine of September, calling for a survival university in which the whole focus of a liberal arts education would be centered around the one unifying principle of survival, and this is the type of thing which we are going to need.

The whole point of the ecology movement may be that our educational system is way off base right now. This is certainly true at elementary, secondary, and undergraduate levels and even at the graduate level. I think we are going to have to seek innovative, completely new programs of virtually any nature; perhaps a med-school-type thing would be good for developing the type of technological ecologists we need, but all sorts of innovative and quite different things need exploring.

Mr. BELL. You made quite a few comments here about how our system must be radically changes in a functional way; that is, both our education and, I assume you mean our governmental programs. In a thumbnail sketch, what do you think should be changed about the educational system?

Mr. KNOWLAND. Everything.

Mr. BELL. That is interesting.

Mr. BRADEMAS. We don't have time to discuss that, I think.

Mr. BELL. Well, I said a thumbnail, across-the-board sketch, and I don't want to put you on the spot, but I am just curious.

Mr. KNOWLAND. If I could summarize it, the whole purpose of this country was set up to insure life, liberty, and pursuit of happiness for all citizens, and that certainly is not an easy process, no matter how it is gone about. Right now I would think that it would be fairly obvious that on far too large a scale we are failing and certainly new methods and new attempts to reach that goal should be explored and attempted.

Miss BUXBAUM. As far as the education is concerned, I am really not prepared to overhaul our whole American system, but as far as the educational system, I am in my last year of what almost all students have to go through, the primary and secondary public school system, and there has been a lack of purpose that I can look back on and say, "I did this for a good reason."

I did this so I could go to college, even before I wanted to go to college; there were a couple of months this year where I was not really sure; but I was not going to school each day to learn how to live; I was going to school to learn some facts. I sat through French classes year after year, and I am in French 6 now and I don't have any interest at all. It has not done me any good at all.

If I had not been fortunate enough to be in the program last summer, which was not part of the educational system, the public school system, then I think I really would have missed the boat the whole way along after all of these years.

Mr. BELL. Speaking of just this kind of concept, we had some people in our "teach-in,"—our hearings—that have gone further than you have—they claim that the best thing to do is to throw out books and teachers and throw out the school system and start all over. But I believe you are thinking in terms of keeping the good aspects of our teaching system, maybe most of it, maybe half of it, and also throwing in some additional things you just learn by going out and seeing and living, adding that as a part of the curriculum, I assume. Is this your concept?

Miss BUXBAUM. Yes. I have no interest in discarding the system as it is. I have a great respect for the teachers and for the system because it has taught me a lot. But it has also left me out in the blue on a lot of things. A lot of things, if I had not been me, I never would have experienced. I am here because I am a particular kind of person. I got myself into the program last summer, but for someone who had not had that experience last summer, he would not have had this experience I am having here and he would never have a lot of things I am having, because he missed one opportunity that set the ball rolling.

There are a lot of good programs that need to be more readily available, and there is a lot of basic freedom in the system that needs to be installed that is not there now.

Mr. Bell. I have a feeling I should not ask this question, but I think I will anyhow. Mr. Knowland, you are not related to the Senator?

Mr. Knowland. Perhaps as a very distant cousin.

Mr. Brademas. Mr. Scheuer.

Mr. Scheuer. I want to say what a great thrill it is to hear you young people talk. It gives us the feeling that although colleagues in government at every level have done a fairly poor job, perhaps a remarkably poor job in our treatment of the environment, the next generation will do a lot better.

Off the record for a moment.

(Discusson off the record.)

Mr. Scheuer. You say you have not had much inclination for science, but now you are determined to get your college training in biology in order to be an ecologist?

Miss Buxbaum. Yes.

Mr. Scheuer. I am delighted by your commitment to ecology. I would be very proud if my daughter, who is a freshman at college, decides to spend her life as a mother or community leader or civic leader or professor in a college. Let me suggest if you are interested in the social sciences, perhaps rather than the natural sciences or art sciences there is an enormous need for people interested in the environmental ecology with economic training and sociology.

Well, for example, you have heard about the worship of "GNP," of a galloping gross national product. You see institutional advertisements by the electric utilities begging, urging, pleading, cajoling people to consume more electricity. The scientists will tell you there is no way we can consume more electric power; You have heard of the need for fossil fuels which do not have fallout into the environment or atmosphere. There is a desperate need for people trained in economics and sociology to take the technical decisions and advise that the scientists have given us and help us weave them into the different phase of our life.

I want to suggest to you that if you have this terrific commitment, and if your natural bent is in community work and economics and sociology, which you obviously have, you should not go into science, because at the present time we have far more knowledge which the laboratory scientists have given to us than we have workers out in the field. And if you really want to do something about the major industrial environmental pollutants—and we know who they are, the answer is in the political support that people like you can give to our city governments, our State legislatures, and our colleagues in the Congress.

I assure you, years from now when you are of voting age, if you come to visit your legislator or the head of your community, or your League of Women Voters, your Catholic action group, your Jewish community council, your Protestant welfare, whatever it is, and if you talk with the knowledge and commitment that you have displayed here today, you will have an influence that I can't begin to describe to you.

So I say to you, if you are thinking about going to college, preserve all of your options and you will have a fantastic impact on ecology and your environment with training in sociology and economics.

Let me make one other suggestion. Don't underestimate the influence you people can have in affecting individual behavior. A lot of our environment problems stem from individual behavior. If you convince the leaders of America that they don't need electric hair dryers, electric toothbrushes, and a lot of other implements and gadgets around the house, you will have an environmental impact of major proportions. If you can convince them that they ought to rely more on mass transportation than on the individual automobile, that we don't need the third family car and perhaps not even the second family car, you will have an enormous environmental impact.

There is an outfit called "Disease TV, Zero Population Growth," in the field of sociology and human behavior, individual behavior. It believes that if you can convince the women of America that the optimum size family, for their own, as well as the nation's benefit, may be three instead of four, which apparently most young families feel is optimal, you will have an enormous impact. And I am sorry you didn't reach me earlier, because I have four kids and I am a lost cause from your viewpoint; but there are others you can reach.

In a sense, what I want to suggest is, do your "thing" in your own way and if your bent is to "tell it like it is", with the wonderful convincing charming eloquence that you have shown, then train yourselves in economics, biology, and the like, to do that.

Miss Buxbaum. May I make one comment in response? Fortunately, from what you say this is what is part of this bill, that the mass media be subsidized by this bill. And the things you were telling me I could do as an individual are what I think this act, this bill, can do, as a part of our governmental system, to get to the people.

A lot more people are going to watch television than are going to hear me. We have "stop smoking" commericals and stop this and stop that from the Heart Association. A lot of very small things that do not occur to people could be interjected in even a shorter time just within the television programs. It occurs to people that cardboard milk cartons are much more convenient, you just throw them away, and if you spill them you don't have broken glass all over the floor. But it didn't occur to me until a couple of weeks ago that we didn't need them. The milk bottles were a more ecologically sound consumer product than carton.

Mr. Scheuer. Let me interrupt. They are not unless there is real incentive for the consumer to recycle them back into the system in an orderly way. If you come to my district and leave your affluent college in suburbia, you will find the system breaks down right after use. The streets are littered with milk bottles. I have introduced a bill that will return us to the no deposit bottle that will prohibit no -deposit bottles. That is the only way to get those bottles back into use that are used 15 or 20 times.

But the present system relies more on economics, and that is why a sharp girl like you with economics and sophistication can play a major role in making the system work better.

Mr. Brademas. I don't want to cut my colleague off, but we have two other members to ask questions and have four more witnesses. So I will call on Mr. Hansen of Idaho.

Mr. HANSEN. Thank you, Mr. Chairman.

I would like to join my colleagues in expressing my sincere appreciation to all three of you. It is extremely helpful and refreshing testimony.

I think perhaps a most pertinent statement was the initial comment made by Miss Buxbaum that we are really talking about changes in attitude. I think you described it as an ecologically sound attitude toward life. While I am impressed in the early days of the hearings on this bill with the urgency of the passage of legislation of this kind, I am also impressed with how limited any legislation is in terms of its effect in getting at the root of the problem.

It seems to me that in matters of the environment, the law really can go very little way and it must be a matter primarily of individual attitudes.

I would also compliment Miss Buxbaum on setting a good personal example in changing, as you described, your life style to practice in effect what you have preached.

Now I will just put two questions to the panel and anyone may respond. I am encouraged, tremendously encouraged by the interest and enthusiasm on the part of young people toward this problem of environmental quality in high schools and colleges. On this committee, where we have been dealing with problems of education, we have been disturbed by a report that comes to us occasionally of the extent of destruction in some of our schools—broken windows, broken lights, marks on the walls, and so forth.

Now let me ask if you think this change in attitude on the part of young people reflected in the greater concern about the environment will also be reflected in a greater willingness to accept responsibility for the preservation of the beauty and cleanliness of the general atmosphere of the school?

Miss BUXBAUM. Not for years. I think not for years, because the kind of damage, is part of just malicious outbreaks, you know, to get back at the schools. It takes one person to break a whole chain of windows down the side of a building. It does not matter if the whole country has an ecologically sound attitude, this person, the chances are, will still go break windows because something has gone wrong with his temper that night, or whole emotional development. As far as total consideration of our communities, as far as keeping paper in the trash cans and putting a gum wrapper in your pocket until you get home, rather than drop it, that too has to come with time attitude. We have been conditioned to think a certain way and behave a certain way, and it takes a long time to reverse conditioning. Conditioned behavior it just takes repetition and repetition, and it takes just as much work to get it out of the system, to get the system to cleanse itself of a poor attitude and to develop this more wholesome way.

I think it can happen in our schools and it is a sad thing because we have to go quickly, but it is kind of a time-lapse thing. Start now and you will see the results years and years later.

Mr. HANSEN. Will you agree that a personal example that might be set by someone like yourself in terms of accomplishing its objective, can have much more impact than the laws we can pass. Effective leadership can come more readily within the range of young people rather than the older generation lecturing?

Miss Buxbaum. There have to be a lot of young people, most of them have to be prodded up on to the pedestal to speak. They can't just sit down in the midst of a student body and preach and expect people to follow their example. A lot of times the student who is writing on the walls and defacing public property is the one who has the very most contempt for the leader, for the one who has accomplished something. He who might feel he has not accomplished something is not going to respond to even further achievement by an academic or social leader.

Mr. Hansen. Let me put one final question, and any of you may respond, and it deals with the aspect of the problem not yet touched on. Reference has been made to what has been termed a national problem in the deterioration of the environment. To what extent have you addressed yourselves to the international aspects of the problem?

We may convince ourselves that we can live in isolation in some other aspects of our life, but it seems to me in stark truth we cannot, in matters of environmental quality. Either we all survive or none of us will survive. This forces us to deal with the problem on an international basis and to reach some kind of common objective and a means to reach that objective, recognizing that the air we breath does not stop at the international borders, nor does the water that circulates in the ocean:

Mr. Schlesinger. I think it has been looked at a great deal by college students with a couple of points of view.

One, I think many of them say "clean up our own backyard before we go around the world to do it." It is realized there is an international problem and that the earth itself is one ecosystem, and it disappointed a lot of college students greatly that the DDT ban did not really affect international exports and things along this line.

I think this is one good example of how students have realized it is an international problem and should be dealt with that way.

Mr. Knowland. The whole point is, we do have but one biosphere, one small spot of life in a vast universe, so far as we know it, which may be literally devoid of anything else of that nature.

Mr. Scheuer. Why do you understand this so well, while we Members of Congress do not understand it at all?

Mr. Knowland. I wonder, sir; whether there really is a difference in the generation gap, you might say, between older people and younger people, whether the fact that we have been supplied with the basics and the necessities of life so easily that we have had a chance to sit back and look and ask why, instead of just how for a change. If so, hopefully, it will be a good and wonderful thing. And perhaps that will be one of the finer benefits of the $24 billion or whatever was spent to get to the moon.

Mr. Hansen. Let me say I am encouraged by what I heard this morning and I want to give you all of the encouragement that I possibly can to continue the course you have chartered for yourselves.

Thank you.

Mr. Brademas. Mr. Meeds?

Mr. Meeds. Thank you, Mr. Chairman.

May I at the outset say I am sorry I was not here to hear your prepared testimony. I have been reading rapidly and have gotten through some of the written testimony and I would like to compliment all of you on your appearance here and to join you in your support of education as a method of teaching us and giving us a great awareness of the necessity of protecting our ecology.

I note with interest, Miss Buxbaum, that you, on page 2 of your prepared statement, say that the outdoor education program deals with what might be called experimental learning based on the premise that kids learn from doing. In this regard, would you think it would be a valuable part of environmental education to have an outing, as you talked about it, in the Montgomery School System? And would you think this would be an essential element of good environmental education?

Miss **Buxbaum**. By all means. As I tried to explain in there, there is no way that any individual can truly, truly appreciate and learn to live with ecology other than to experience it, and you can't experience it in a classroom. Classrooms, themselves are contrary to the whole feeling that you get when you are outside living a certain way. And it does not matter what kind of scenery, what kind of teach-ins, what kind of anything you put in the classrooms, unless it is supplemented with outdoor living, it cannot become a working part of the individual's learning.

Mr. **Meeds**. In addition to the legislation which we presently have before us—and I hope the chairman does not mind if I depart just momentarily—but a number of us, I think most all of us on this subcommittee, are also sponsoring legislation which we refer to as the Youth Conservation Corps, which provides for 70 days of work at a reasonable rate of pay in the national forests, Bureau of Public Lands, and in the national park systems of this country. That is essentially a work summer experience in helping to provide trails and conservation by preventing soil erosion, and things like this, on our national lands.

Would you think that this type of program that we are considering here today could also be fitted into that to enhance the environmental experience of the actual work?

Miss **Buxbaum**. Well, I touched on it in my testimony and because of the matter of timing, there was a lot of things I didn't bring up, a lot of innovations I feel have to be brought into the school system, that would provide this kind of training that is away from the school, that is out doing what you are learning. One can't go out and practice ecology without some factual knowledge he has been given in the classroom; but he can't do anything with the factual knowledge unless he has a chance to practice it.

I feel that this kind of working for the problem, not just for himself to learn it, but working for the problem is a very integral part of the environmental education.

Mr. **Meeds**. Mr. Knowland, would you have a comment?

Mr. **Knowland**. Once again, I would simply urge that such things as that be attempted and be attempted well. The key to success will be in the type of people that you have leading the program, if nothing else, and there again, perhaps development of those leaders. We have some very good people in this country but we need a lot more of them.

Mr. **Meeds**. Sir, do you have anything to state?

Mr. SCHLESINGER. Nothing in particular. I would just agree with Mr. Knowland. We need people to lead this, and I think we can look to the results as leaders of the future.

Mr. KNOWLAND. I might comment that a program such as the Youth Conservation Corps might be a very valuable method for acquainting a large number of, well, especially inner-city-type youths with outdoor experiences which they might not otherwise get. Something which struck me pretty deeply since I first read it, and I have forgotten who said it, but that an American, if he is anything new and different at all, is simply a civilized man who has renewed himself in the wilderness. And this could be the sense of what was the American character and something which seems to be fading out of whatever the American character is today, and it is something I don't think we need to lose, I don't think we can afford to lose, rather.

Mr. MEEDS. Are you people aware that there are approximately 5 million acres of national forest lands which need to be reforested, not forested immediately, but could be reforested immediately?

Mr. KNOWLAND. I think there would be far more land which could be reforested or otherwise as well.

Miss BUXBAUM. Mr. Meeds, I would like to add one thing. Our discussion seems to have been centered on the wilderness area and outdoors type of things that are beautiful and pleasant to do, but there is also a problem with the cities. I am not sure whether I am interested in this totally rural ecology problem or whether I would be more interested in going into the urban problem of sound ecological development: city planning and wise architecture and its relationship to the area that is being developed, which also needs ecologists on the teams.

When cities are built, they have road construction people, architects, sociologists, and everybody else that fits into it. But they must have ecologists also to build a city that is going to be able to sustain whatever natural vegetation or animal life is left. You can build up a city and leave a park, but if you do it wrong the whole park is going to die because of the way it is built. So this is part of it and this kind of thing could also be incorporated in what you just brought up. Perhaps the inner-city people that Mr. Knowland brought up should not necessarily be deported out in the country to understand the country. Since they are the ones that are going to have the best understanding of the city, they should be the ones that are getting themselves involved this way.

There is no sense in taking a city person just to let him see the trees and let him taste that before he goes back to the city, just as there is no sense in taking someone who spent his life out in the Midwest on a farm and putting him into Chicago and letting him try to develop a city, develop a new housing project. Forces can be utilized where they have the best background. If it is in the history of an individual to have lived in the city and he knows how to cope with it in a certain way, he is going to be more prepared to propose remedies and solutions to new problems.

Mr. MEEDS. Your point is very good. This is an extremely diverse field and it needs to cover a very broad spectrum, and I would agree with you.

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Thank you all.

Mr. BRADEMAS. Thank you very much.

And may I thank Mr. Knowland and Miss Buxbaum and Mr. Schlesinger for your most helpful testimony. We appreciate it very much indeed.

Mr. BRADEMAS. We will now hear from Garrett de Bell, who is editor of the "Environmental Handbook."

Mr. De Bell.

STATEMENT OF GARRETT de BELL, EDITOR, ENVIRONMENTAL HANDBOOK, WASHINGTON REPRESENTATIVE, ZERO POPULATION GROWTH

Mr. DE BELL. I would like to respond to some of the questions that have already been asked by some of the Congressmen, but I will do that later and integrate it with my remarks.

I am Garrett de Bell, the Washington representative of Zero Population Growth, whom I have recently started working for, as a registered lobbyist. ZPG is actively working for stabilization of the population of the United States and is seeking constructive solutions to the environmental problems that result in part from excessive population size. We lobby for legislation that makes ecological sense, support public officials whose policies make ecological sense, and work for the defeat of those who do not.

I am sure that there is general agreement that education and public awareness of ecology is critical to the resolution of the ecological problems that threaten the quality of life and even the future existence of the human species. This hearing is evidence of this committee's commitment to do something in this area. ZPG applauds the purposes and intent of H.R. 14753. We will make the bulk of our testimony in the area of changes that we feel will increase the effectiveness of the bill.

Zero Population Growth is concerned with the environmental problems that are a direct and unavoidable consequence of a population that already exceeds a reasonable size and continues to grow at an explosive rate. If the U.S. population is not stabilized, we will have to contend with a population of over 300 million by the end of the century. There is very little chance of solving any of our social and environmental problems if this growth continues. The relationship of population growth to environmental problems is not stressed in H.R. 14753. We suggest that the wording be modified to specifically include population and the balance between population size and environmental quality. We propose that section 2. (a) line 8 be changed to * * * of its ecological balance and the balance between population size and environmental quality is in * * * Throughout the bill the term ecological balance should be followed by the phrase "and optimum population size."

The need for environmental education, I think, is very clear. For instance, Congressman Scheuer just made the remark we need to go to a three-child family in the population increase.

Mr. SCHEUER. May I remove any concern of yours that we are not keenly concerned about population. I was the author of a bill that would execute a comprehensive reorganization of the Family Planning Services and that would give us a Manhattan project approach to the development of family planning needs, and techniques that are appropriate for under-developed population. Senator Tydings introduced this bill on the Senate side. And I think most of the members of the subcommittee joined in sponsoring the bill. So rest assured we are quite aware that the implications of population growth are relevant to the question of the environment. We share your concern.

Mr. De Bell. We are quite aware of the bill and support it. The point I wanted to make is, that a three-child family would be a long way from population stability. In fact, if from now on every family in the country were a two-child family, we would still have such a rapid population increase that it would go up to about 300 million.

Mr. Scheuer. I understand from the demographers that a zero rate of population growth would be something like 2.2 children per family.

Mr. De Bell. That is true in a steady State population. Right now, we have a growing population and have been growing in the past.

Mr. Scheuer. And that a two-family rate of reproduction would give us a rather rapidly declining population.

Mr. De Bell. That is true in a population which has remained stable for a while. Our population has been growing for the last few generations, in fact since 1492. This means, each year we have a bigger age class of women at childbearing ages. To level the thing off, you have to sort of shrink it back down in all age classes, and this requires a negative rate for a while. There are two different situations in population. The population has been growing in the recent historical past versus one that has been stable. They have different age structures or percentages of people at each age. We can get into details later. Throughout the bill, the term ecological balance should be followed by the phrase "and optimum population size." We think this is critical to any area of ecological education.

Now I want to get into the specifications of the administration of this act. There is one other aspect of this bill which concerns us. Section 4, approval of applications, sets forth requirements for bookkeeping, auditing, and reporting which applicants for assistance under this act must fulfill. It is an old story with Federal programs that when Federal assistance finally becomes available for a problem like this it is so wrapped up in redtape that those very groups which created public awarenes of the problem cannot qualify for grants or aid. The purposes of such supervision and monitoring are valid, but the result of the procedures actually adopted often eliminates many of the organizations which could best use the funds: small, volunteer groups of local citizens which are already devoting their own time and resources to solve the problem but which may be badly prepared to negotiate with the Federal bureaucracy.

The Congress has a choice. It can write into this bill the routine language, and can require the usual paper work. It will end up providing grants to exactly those large, established institutions which have displayed total indifference in their educational efforts to environmental considerations. Or Congress can modify the usual procedures and minimize the administrative burden on applicants for aid. This will help the small, unestablished group, the group which has no auditor because it has no regular sources of funds, the group that has no fixed overhead charges because its members absorb the overhead, the group, in fact, which laid the groundwork of public concern for this hearing. Zero Population Growth fails to see the connection between intimate knowledge of the corridors and layers of the Federal bureaucracy and concern and dedication to the preservation of our world. In fact, if anything there is a connection between this type of established, bureaucratic outlook and the very educational practices and attitude which have led us to despoil the environment.

A specific example: Section 3(a)(4) provides for grants "to local educational, municipal, and State agencies and other public and private nonprofit organizations for community education on environmental ecology, especially for adults." The current contribution of school systems and other government agencies to this awareness is virtually nil. The purpose of this bill, of course, is to provide those agencies with funds to do their part of the job. But in many cases it is not funds that are lacking, but will and interest. Even as these agencies develop that will, much will remain to be done by the citizens group. In virtually every community in the Nation such groups have begun the fight to save the environment and educate their fellow citizens. Congress ought not to deny them an important role in developing programs of environmental education.

Furthermore these groups, by the very voluntary nature which makes it harder for them to qualify for grants under conventional procedures, can make better use of limited funds than well established organizations. A dollar of Federal money matched with the energy and interest of the members of such groups will go a lot farther than a dollar of Federal money which has to be spent hiring that energy and interest.

Therefore, Zero Population Growth would like to suggest to this committee that it be a clear part of the legislative history of this bill that the Congress does not wish to exclude any otherwise qualified organization from receiving assistance simply because of that organizations inexperience with Federal grant and aid procedures, its lack of regular auditing staff, or its informal administrative structure. We would like to suggest that technical assistance should be made available by the Commissioner to such groups to enable them to provide the Federal Government with necessary monitoring data on the expenditure of public funds, but that such requirements should be kept to a minimum. We would like to suggest that one of the criteria to be considered by the Commissioner in providing assistance should be the past record of the organization in the problems of environmental education and public awareness, its past efforts to solve these problems, and its history of independent and voluntary efforts to advance that goal with its own resources.

In a more general vein, I think it is very important that this committee consider the overall role of the universities in the environmental crisis. The problem has not been simply lack of effort in one phase or another of environmental problems. Rather the basic purpose of the universities in teaching and research has been to encourage ever-increasing specialization and professionalism at the expense of the broad education necessary to a democracy that depends on an enlightened electorate.

A large majority of the faculty of our large universities is dedicated by training and habit to the overspecialized type of study that has been a major contributing cause of our present state of ecological crisis. They are fond of blaming all problems on "the administration," or a conservative board of trustees, or lack of funds, but the problem has been the reluctance of the faculty to continue their own education and growth as times changed and their failure to develop, and even to allow others to develop, truly interdisciplinary teaching and research.

The situation here should be very familiar to you gentlemen as a very similar one prevails in the U.S. Congress, that is the committee and seniority systems which reward longevity and specialization—not ability an dedication to human purposes. The seniority system prevails in both the Congress and the universities. In both, it has prevented those institutions from effectively dealing with the problems of our times. You are familiar with the situation in Congress. I will touch on the problems the seniority system causes on the university campus.

The older faculty control the committees that set course content, faculty hiring, fellowship support allocations, and degree requirements. They decide on faculty advancement primarily on the basis of professional standing as determined by output of publication of suitable specialized papers. Creative teaching interdisciplinary research or teaching, or working to develop action programs based on sound knowledge are not regarded as valuable ways for faculty time to be spent. The rewards for both faculty and students go to those who will become highly expert in some narrow area of specialization.

Some of this specialized research is socially valuable and, as I can attest, some of it is of great academic interest. But in a world that is rapidly approaching disaster, we must question our priorities. After seeing how well the faculty at our universities have enforced specialization at the cost of breadth and have resisted interdisciplinary teaching and research, I would not like to see legislation which lets the fox guard the chicken coop. We should use the environmental issue to force the reform of the universities that is necessary in other areas as well as in the area of the environmental crisis.

This bill should include specific provisions implementing the proposals in the publication "The Universities and Environmental Quality: Commitment to Problem Focused Education" (a report to the President's Environmental Quality Council), prepared by John Steinhart and Stacie Cherniak. This report stresses that effective multidisciplinary problem focused programs were only successful when the faculty in the program had complete control of the faculty reward structure, course content, and requirements for degrees. This is necessary to prevent the majority of specialists from undermining the creative few who are moving into the vacuum and working between disciplines.

The implementation would be as revolutionary as genuine congressional reform. Funding under this act should be restricted to groups which have the degree of independence suggested in the above report.

I would like to enter into the record of these hearings two further items. One is an article, "Education and Ecology," which I included earlier in my statement and which I wrote for "The Environmental Handbook," edited by myself and published by Ballantine/Friends of the Earth. The other is a bibliography on education from the same handbook. I feel the reading of a few of the books on this list might help to give Congressmen and their staff some better feeling for the reasons why so many students regard the education system in this country as inconsistent to basic human purposes.

Thank you for the opportunity to testify.

Mr. BRADEMAS. Thank you very much, Mr. De Bell.

Maybe you could tell us what the "*Environmental Handbook*" is.

Mr. DE BELL. I was not blank on doing a sales pitch.

Mr. BRADEMAS. I will give you that opportunity.

Mr. DE BELL. "Friends of the Earth" asked me if I would put together a handbook to sort of go along with the environmental teach-in and be available as a source book for the people wanting to get an overview of the ecological problems in a one-shot package. So I put it together and Ballantine Press published it in conjunction with the Friends of the Earth. And we have something in the order of a million copies, I think the last order was 700,000, and we are trying to get a lot of information out to people to stimulate them in this area.

Mr. BRADEMAS. I note the article to which you made reference, I think I am correct in saying, in *The Environmental Handbook*. You wrote that a number of universities in the United States are doing research work, engaged in research that you suggest, to quote you, "raping the environment." Could you elaborate on that, what you had in mind by that charge?

Mr. DE BELL. Well, for instance, a lot, in the area of past control, for instance, a large amount of research is being done in the area on chemical pest control and some by private endorsement. The University of California at Davis does a large amount of work in the area. Until the recent past they have been more or less antagonistic to people who wanted to follow the more ecological sound means of biological controls of pests. In fact, members of the campus who tried to get into biological control were not regarded as contributing in anywhere near the magnitude as the people working on chemical control.

A lot had to do with the fact chemical industries supplied a lot of the funds, such as for the University of California at Davis.

The only thing I mentioned, I alluded to the development of things like automatic crop pickers. These sorts of things have no useful purpose. They, in a sense, are a large subsidy by the Federal Government to benefit the large agriculture business and the farmworkers put out of work are not compensated and taken care of, and become an overpopulation problem in the cities which they represent. They would like to stay on the farms and like to do farm labor, but want to do it in better conditions and better labor, and so on. They didn't like the idea of being put out of work.

What I suggest is, an over-analysis of the problem would never be done in the universities at this time.

Mr. BRADEMAS. Let me turn now to the bill under consideration, which I have one general question on whether you might want to make a comment. You already made some observations in respect to the question, but you notice in section 3 of the bill we spell out the various purposes for which it is contemplated that the funds could be expended. One is to make grants to colleges and universities as well as to other public or private institutions, agencies, or organizations for developing curricula in the environmental field, and another to develop, or to demonstrate, or to prepare pilot projects to demonstrate the effectiveness of such curricula, and another to provide for the dissemination of curricular materials and other information regarding the environment and ecology.

And then we provide in the bill that funds can be expended for evaluating the effectiveness of curricula that might be used in elementary and secondary school classes, college classes, and adult education programs in these pilot projects.

Then we go ahead to provide that funds could be expended for preservice and in-service training programs on environmental training and ecology for teachers, public services personnel, community leaders, business leaders, State and local governmental officials.

And then we provided that funds could be used for community conferences, as it were, in which a wide variety of persons could take part in order to give some encouragement to adult education in the field.

And finally, we provide that funds could be provided for preparing and distributing material suitable for use by the mass media in the environmental field.

Now I don't think that, as the bill is written, it would exclude the expenditure of funds along the lines you were suggesting, through organizations that were not strictly part of the school system.

Is there anything we have forgotten in this bill in order to give encouragement to doing a better job of teaching?

Mr. DE BELL. I think part of that is spelled out in part of the written testimony that I didn't read to you. I am not suggesting under the bill the kind of organization I would favor couldn't legally get the money. The point is, that a lot of the established organizations such as Government or peripheral to the Government, the universities have huge staffs whose job it is to solicit money. People that know all of the intricacies of the Federal bureaucracy but don't have a feel for ecological problems.

A lot of the local groups that have a feel for ecology have no feel whatever for dealing with bureaucracy and by the nature of how you got the grants would select themselves out. And, as I say, the Government, if it wants to involve these groups, will have to take an active step and change the normal kind of accounting and bookkeeping procedures used, to draw these groups in. Otherwise, they won't do anything with it and have the Rand people develop a system that would keep people from throwing things on the streets, and develop contour plowing. They have been doing it for years, and it does not do any good. This kind of business approach is not going to do it. We need citizen involvement.

Mr. BRADEMAS. I appreciate the thrust of what you say. Let me make two observations in respect of what you said.

In the first place, many of the colleges and universities are not all that sophisticated and effective in getting their hands on Government money and making their way through the jungle of redtape as you might suspect.

And the other point I would make is, that to some extent, while I agree with your descriptive statement that the school system and the educational system generally are not at all aware enough of the ecological problem, that it is in large measure to help them become aware that this bill has been put together.

In other words, we don't want to get caught in a circularization here. The school system, whether one likes it or not, exists. And I think it is our hope that we can help harness some of the existing structure to enable it to make a greater impact on public awareness. I don't think you would quarrel with that proposition.

Mr. De Bell. No. What I suggest is to make this maximally effective. And I agree with your basic purpose here, is that you have to realize how entrenched faculty hierarchy has acted to stifle it for a long time. There are a number of professors at the University of California at Berkeley who have tried for years to do things in this area and who have tried to do the things which your act suggests for 10 years. But the faculty hierarchy put them down every time, and some of the people now jumping on the bandwagon saying that we have to do it are the same individual people—and I will name names, if you would like them, of people who have been effectively stifling these professors for years and years and years.

And what I am saying is, I can't give it to a university department or go through the channels of the university department which has been antagonistic to this for many, many years. I am saying that this report by Steinhart and Cherniak, if you read it carefully, they say the same thing; that we have to take the people on the campus that are sympathetic to the basic purpose of the bill, and let them get money independently and to not be dependent on the department committees, curriculum committee, which determines all the courses that may be taught on campus today.

We have to break that up, and a good way to do it is money. If you set up the program, it must be totally independent. But you pick good people and they administer the money and they do not have to report to the department chairman and deans and so on.

Mr. Brademas. I must say that I laud your point of view on that, and I will take it up when we get into deeper discussion of it with Dr. Steinhart.

Mr. Hansen?

Mr. Hansen. Thank you, Mr. Chairman.

I have no questions. I apologize for having been absent for a few minutes, as I had to attend another committee meeting. But I want to join with my colleagues in expressing our appreciation for the very helpful testimony you have given.

Mr. Brademas. Mr. Scheuer?

Mr. Scheuer. Mr. De Bell, I was interested in your testimony. I couldn't agree more that we are in desperate need of a yardstick, and I am talking about the kind of goal and stimulus that "TVA" was earlier—though it may be a little before your time, fortunately it was not before my time. Then we would see what they could do. That would set up competition with the private utilities.

I don't think we can push the education establishment out of this program. I think you probably would agree with Congressman Brademas's statement that it would be foolish to do so. We can't say, "Because you have not done a good job up to now, we are not going to let you participate." I think it is essential that we allow nonestablishment groups to participate; and if the educational establishment does not want to get into the ball game, then there are plenty of nonestablishment groups. And we have had an example as such in the poverty program, as to how effective this approach can be.

The whole Headstart program was, in a sense, an application of the yardstick formula. We were saying to the educational establishment:

> Look, you fellows have been asleep at the switch. You have not done anything about preschool education. We are going to provide funds for churches, settlement houses, nonprofit groups, so they will get into the preeducation school field. We hope you will too. But if you don't, we will let them do it.

I couldn't agree with you more that we have to write the law in a way that permits recently structured citizen, students, and faculty groups of all kinds to get into this business. Having shown concern and competence and leadership, they should be able to get into the business without excessive Government redtape, preventing them.

I don't think we can do much to change the past auditing requirements of Congress I don't think you probably want to do that either.

Mr. De Bell. What we are suggesting is, that the Government give aid in doing it.

Mr. Scheuer. There is a problem of what you have to show to get into the ball park. We ought to make that requirement short, and simple, so that a clear statement of demonstrated concern and of minimum professional competence should be enough to get at least an initial planning grant.

I want to assure you that this committee will do whatever it can consistent with getting the bill passed to make sure there are no roadblocks to groups like yours.

I would like you to tell us about one of the groups that I also am familiar with, Environmental Action, Inc.

Mr. De Bell. Which one? You could mean the ecology center or ecology action.

Mr. Scheuer. Ecology action, or ecology center. I think Berkeley had some of the best experiences with involved students like yourself, who have shown admirable leadership. I was a delegate to a UNESCO Conference on Environment in San Francisco a few months back where the students really outperformed everybody else. As a matter of fact, they tried to not let the students' really important motions come to the floor. And I stood up and said, "Look, the students have shown us the way and they are way ahead of us. Let's have them do their 'thing'."

In any event, the Berkeley students played a very constructive role in that UNESCO Conference. I wonder if you could tell us about the role that they played, how they got started, and the potential they offer us in giving just minimum nudging.

Mr. De Bell. I would like to say that I was at the UNESCO Conference and appreciated your support on the floor, and I was there when you did it. As to the way this thing happened at Berkeley. I think I would have to write a book to go into the history of it. But in terms of the educational effort, a long time ago, or approximately 4 years ago, the students started to pressure the university to get active in ecological education, and we ran into heavy roadblocks and they were unalterably opposed, with the exception of a small number of individuals.

So we took over and started teaching our own ecology course and the enrollment figures, I am sure, were embarrassing to the faculty. Because we took over and we could teach better ecology courses than they could because we understood better.

Mr. Scheuer. Who taught these courses?

Mr. De Bell. I taught one and Mark Lepay taught one, and these were the two biggest ones.

Mr. Scheuer. Were you an undergraduate?

Mr. De Bell. A third-year graduate student, and he was a recent Ph. D. I taught courses through our sort of experimental program called "Center for Participation Education." We cut the enrollment off at 200 on the first day. This was a larger enrollment than for all of the other ecology courses put together. A lot of our students could not get credit for the course, because of the way the university is structured, but we were able to maintain large enrollments throughout the quarter. In my case, half of the students obtained formal credit through means that were actually on the fringe of the rules. It was borderline in the case of the rules, and we tried to cut the line as closely as we could.

Mr. Scheuer. You may want to correct the record to protect the students.

Mr. De Bell. I don't think so. We had read the rules as tightly as we could, and we acted as a corporation would and stayed exactly within the letter of the law.

Mr. Scheuer. But you were clearly within the letter of the law and let the record be clear about that.

Mr. De Bell. Yes; as far as we could. And we are speaking of the university rules, by the way.

What happened is that the university, I guess, finally realized there would be money in it and they started to come along and offer programs now.

Some of the faculty members involved in the program have told me they are a little concerned that the establishment will emasculate the thing as soon as they get started, because the people in the faculty are concerned that the people affected will try to effect interdisciplinary education.

Now the most heartening thing is the students educate themselves now, and I think self-education is a lot better than just sitting in a classroom like a sponge and just absorbing all of this stuff and a lot of the people are locking together ecology with politics, which is interact with the environment, unless you consider how the political necessary. You can't worry about the environment, and organisms interact with the environment, unless you consider how the political system interacts with it.

This is done through a lot of groups in the Berkeley area, such as in the case of people having a park, that after seeing the kind of problems that came from violence in the streets, it was decided in order to win out on some of these things we needed massive support of the people, and got together and held massive citizens meetings with all of the citizens in the area affected by the given city council decisions, such as where they were deciding to put in a new city street and we got the citizens together and presented arguments about how they would be better off with a park rather than a street, and we got together with the city council and fought the battle on the establishment's own terms, and we won.

This, I think, has a beneficial impact in that it gets people politicized and aware of how to act to change this ecological crisis. This is an area where we move in as rapidly as possible.

Now I think the answer I would have given to Congressman Brademas' question earlier concerning the question, "What about the war? Isn't interest in the war being diffused by colleges mostly?" And I have this answer to that.

Mr. Scheuer. Well, not only war, but civil rights also. The civil rights do fit into the urban problem fight, the whole fight.

Mr. De Bell. Exactly.

Mr. Scheuer. For, better education, welfare, and law enforcement programs are related to the reallocation of resources from the war to our essential urban programs and systems and the restructuring of the systems.

Mr. De Bell. That is what is critical, to actually show the ecological problems, which is going to require a fairly radical restructuring of many of the institutions in society, educational, and governmental. If we can get people concerned over any issue like the rich residents of Santa Barbara, with the oil spill, they are going to realize who the Government is responsive to and will find out it is responsive to Standard Oil and not to a thousand concerned citizens.

And presumably they will start asking questions about how the Government acts and hopefully we will start getting politically active in an effective sense and change a lot of things, like the cast of characters in the Congress and swing the balance in our direction and keep a heavy pressure on these guys to continue voting our way as opposed to the way they are dictated to by, say, the industries' interests that are donating money to them or opponents, depending on how they vote.

This is the way I view the problem, coming to grips with the ecological problem, which is going to cause a wave of politics by the people in this country that, hopefully, we can come to grips with a lot of the other problems.

Mr. Scheuer. Do you see the young people of the country, concerned with effective legislation or concerned with somehow or other getting out the message that individual patterns of conduct and individual values also can be changed to help the environment?

Miss Buxbaum gave me the impression that she didn't place much priority on getting out the word that individuals have to change their value structure, have to change their priorities, have to change their whole life style. These changes, in effect, would augment our legislative efforts in controlling the major industrial environmental pollution.

Mr. De Bell. There is sort—well, a lot of people advocate political and a lot of people advocate personal change. I think what I try to make people aware of, and I think consciousness is starting to emerge, is that both have to happen.

In the area of personal awareness, we have to have an awareness that we have to have a much smaller family size, such as a two-child family. And in the area of supersonic transports, it is strictly a governmental decision. And in order to stop it, we are going to have to get our people politically active, so that in this area it would be a governmental decision, where we try to put political pressure on the people making the decision.

In the area of consumer protection, it can be attacked at the individual level, where we have to try to change our life styles and get our people not to be a market for this stuff and to use the boycott and other means to put companies out of business that are producing this junk.

Now, the other way is to act at the governmental level to try to regulate advertising so that the advertisers will stop doing this advertising on smoking, and so forth, so we should see it going on on both levels.

Mr. SCHEUER. Let me interrupt there. I suggest that this is exactly the ideal area in which individual action can be positive and constructive where you, as a member of the American Civil Liberties Union, which I hope you are a member of——

Mr. DE BELL. Naturally, I am a liberal.

Mr. SCHEUER. You would not hope, I think, to have the Government tell a private group what it could or could not advertise for. I would be shocked to have any government tell GE that it could not put out an institutional add urging people to consume more electricity. I would be shocked not so much as a member of the American Civil Liberties Union's National Board of Attorneys, but as a citizen concerned about the environment. I would do everything I can as a private citizen to make the utility companies know that this is not the way to encourage good public relations among thinking Americans and that it would be unproductive for them to carry on that kind of advertising.

Mr. DE BELL. In this area, what I would say is, if an area like the public-utility area, continues to advertise to try to increase power consumption, which they are doing aggressively now, I think they should be made to stop or, if not made to stop, that the people that want to counter their ads should be provided with the revenue necessary or equal time necessary to be able to counter them in advertising, because the utilities constantly produce false advertising.

Take in the area of detergents, they say if you get their detergent you will get clean and shiny dishes. But they don't tell you that you will get crummy rivers. I think they should be forced to include that part of the message or the public should be given equal time.

Mr. SCHEUER. Then they may have told the truth, but not the whole truth.

Mr. DE BELL. Yes; partial truth, I think, is equivalent to telling a lie.

Mr. SCHEUER. Well, maybe this equal-time business is something we should work on.

Mr. DEBELL. We are presently pressing that area at the present time.

Mr. BRADEMAS. Thank you very much, Mr. DeBell. I think you have already made a great contribution to our understanding, and I am sure that with the publication of your environmental handbook, your name will become very well known as one who made a significant contribution in this area. Thank you very much.

(The document referred to follows:)

EDUCATION AND ECOLOGY

(By Garrett De Bell)

Education, particularly higher education, is critically important to solving our ecological crisis. At present, universities do much of the specialized research which develops the technology that is raping the earth and threatening our survival. They do this job devastatingly well. Yet the knowledge and wisdom to apply technology wisely is neglected. The whole direction and purpose and thrust of our culture is toward greater production, greater exploitation. In many, if not in most of our universities, there is little criticism of the basic assumptions and value judgments that underline our current priorities. The university is quite capable of developing an automated machine to harvest almost any crop, but it is unable to evaluate the long-term social costs of such a development. Do farm workers want to be forced out of work and into the cities? Is it desirable to replace people with machines whenever it is feasible? Does this use of machines increase the crop, or just the profit? Some of these machines use gamma radiation to determine if the crop is ripe. Is this a safe and desirable practice? Special strains of crops are developed by plant-breeding programs to meet the needs of the machine system—strains with synchronous ripening, uniform size, tough skins, and long storage life. Does this selection have a detrimental effect on food value? Use of machines makes us more dependent on high technology and the energy needed to make and run the machines. Should we continue to replace labor by energy-using machines when petroleum reserves are sufficient for only a few more generations and energy use pollutes the environment? These are the kinds of questions that go unasked.

The universities are characterized by increasingly narrow specialization in all fields. For instance, ecology as a field emphasizing interrelationships—the study of the total impact of man and other animals on the balance of nature. Yet only a few professional ecologists are willing to brave the disapproval of their narrowly professional colleagues by pursuing the broad spectrum that ecology implies. Some of their names are household words—the late Rachel Carson, Paul Ehrlich, Kenneth Watt, Barry Commoner, Lamont Cole, and Garrett Hardin. The rest do very specialized studies that appear in journals such as *Ecology*, *Ecological Monographs*, and the *Journal of Animal Ecology*.

The biological and social sciences are trying to emulate the elegant work of a few nuclear physicists and molecular biologists and are learning more and more about increasingly trivial subjects.

Very little research is aimed at developing alternatives to our present disastrous pattern of existence with excessive production—waste; conspicuous consumption; manipulative advertising; growth for its own sake; poverty in the midst of plenty; and destruction of the air, water, soil, and organisms that are the basis of the life-support system. One reason that we don't get the right answers is that we aren't asking the right questions.

Probably most important is that we are not providing the kind of education that will allow the electorate to evaluate the choices that are, or will be, available to them.

Our system is, in a word, geared to diplomas, not education. What is to be done? A statement of Paul Goodman's is appropriate:

"Today, because of the proved incompetence of our adult institutions and the hypocrisy of most professionals, university students have a right to a large say in what goes on. . . . Professors will, of course, teach what they please. My advice to students is that given by Prince Kropotkin, in 'A Letter to the Young': 'Ask what kind of world do you want to live in? What are you good at and want to work at to build that world? What do you need to know? Demand that your teachers teach you that.' Serious teachers would be delighted by this approach."

A recent report to the President's Environmental Quality Council (OST 1969)[1] recognized many of the barriers to effective multidisciplinary education on the campus and makes specific suggestions for reform. It recognizes both the need for people trained much more broadly than the present overspecialized Ph. D. and the resistance within the faculty to truly interdisciplinary work. It found that only separate institutes that had control of the faculty reward structure (raises, tenure, hiring, and firing) and that had complete "freedom to be innovative in introducing course material, educational programs, work study programs, and curriculum requirements for degrees were successfully achieving meaningful multidisciplinary teaching and research." They found many students coming to these programs after lapses of many years in their schooling, because they felt their earlier education was inadequate for interdisciplinary work. They also found students eager to work in programs aimed at finding workable solutions to our environmental problems.

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[1] OST 1969: Office of Science and Technology, Executive Office of the President, *The Universities and Environmental Quality—Commitment to Problem Focused Education*, a report to the President's Environmental Quality Council by John S. Steinhart and Stacie Cherniack, September 1969. For sale by the Supt. of Documents, U.S. Government Printing Office, Washington, D.C. 20402, price 70 cents.

At least, good ideas on education have been presented to the federal government. Since these ideas will require real changes by the people who control the universities, the trustees, the department heads and deans, there will be vigorous opposition to implementing the proposals. If you are interested in education reform, get hold of the report and press for change on your campus.

It will be a challenging task to make our education system both uplifting and truly relevant to our environment. There is a chance to revitalize the system around the central theme of survival and ecology as suggested in John Fischer's article on page 134. In their calls for a relevant education, students have shown tremendous enthusiasm for study that relates to solving the social and ecological problems that are threatening our existence. They would respond very favorably to efforts by faculty and administration to devote more of the universities' teaching and research to important environmental problems on all levels, especially where they could get directly involved, as through work-study programs. Real inquiry may rescue the university from the sterile degree-and-diploma game it has become.

SUGGESTIONS FOR ACTION

Examine the course content, curriculum, and research of your university or college to see if there is a reasonable balance between pure and applied research; between teaching and research that perpetuates present trends and that which questions trends and suggests alternatives.

How can you make your field relevant to serving our environment? Take surveys of graduate students to see how many are pursuing relevant theses and how many would like to. If the numbers differ significantly, ask questions about the reasons they have not chosen relevant topics.

Check into faculty salaries, fellowships, and grants in different fields and subfields to see where the main priorities are in federal and campus programs. Are these priorities good? See how your local representatives at state and federal levels feel about these priorities and then volunteer to campaign for them or for their opponents depending on their answers. Check the voting record against their answers to be sure.

Set up an experimental college with faculty controlled by students to get some open discussion and fresh ideas. Hire graduate students, uncredentialed people with experience in the real world, politicians, or anyone else you feel could get out of the overspecialized, study-problems-to-death academic syndrome. One dollar per student per quarter at U.C.-Berkeley could provide $108,000 for this purpose. This could provide ten full-time faculty appointments. You might choose to bring in people for a quarter or shorter periods to get more variety. Appointments could be made by the student senate, if it is representative of the general student body on your campus. Provision might be made to ensure that small interest groups were able to have an influence. The purpose of the experimental college would be to counter the university's resistance to change. There are a great number of vested interests in the faculty and administration that resist any change that might alter their power. Students don't have the same vested interests and are more willing to experiment.

EDUCATION

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ENVIRONMENTAL TEACH-IN PANEL—STATEMENTS OF DENIS HAYES, NATIONAL COORDINATOR, ENVIRONMENTAL ACTION, AND BRYCE HAMILTON, HIGH SCHOOL COORDINATOR, ENVIRONMENTAL TEACH-IN, INC.

Mr. BRADEMAS. Our final two witnesses this morning are Denis Hayes, director of Environmental Action, and Bryce Hamilton, coordinator of High Schools for Environmental Action.

Gentlemen, come forward. We look forward to hearing from you.

Mr. HAYES. Mr. Chairman, thank you very much for inviting us to comment on the proposed Environmental Quality Education Act.

Two critical fallacies permeate the proposed legislation, and serve to undermine its goals.

The first of these is an outrageously antiquated view of "education" as the process of transferring a body of factual information from a source to a receptacle. The second is an inherent assumption that there is a "body of factual information" in existence which contains adequate solutions to our potentially catastorophic ecological condition.

I would like to address each of these briefly, and then make some specific recommendations.

Societies develop specific institutions at particular points in time to perform specific functions. Among the most important functions to be performed in a social system is that of preparing new generations to cope with the problems of life.

A traditional—and still commonly held view of education—is this: The prime source of knowledge is experience, and man has the ability to "learn," not only from his own personal experience, but also from the experience of others. He can learn from his peers. He can also learn from his ancestors.

In order to efficiently accomplish this process of "education," this learning from others, a series of institutions developed. They were based on two assumptions: (1) Younger people, with relatively less experience, would learn from older people, with relative more experience. (2) The greatest source of knowledge lies in the recorded experience of past generations—frequently alluded to by college deans and commencement speakers as the "accumulated intellectual treasure of Western civilization."

At the point in history when they evolved, our schools probably served their ends reasonably well. But times have changed, and our schools haven't. As a result, the best schools in the country are virtually irrelevant to the real educational process. The typical schools are worse than irrelevant; they are overwhelmingly counterproductive.

A great many brandnew things are occurring every day. Some of them just plug into the wall. But they all have a cumulative effect upon the context of the society. It is not the old situation with a few new elements added. It is a new situation. And while experience—

even the experience of bygone centuries—still has some validity, there is no longer the easy equation of experience with knowledge, or of age with knowledgeability.

What one learned from experience yesterday—let alone last year or last century—may no longer be correct. The situation is no longer identical. And the "facts" accumulated with age serve much more frequently as a mental straitjacket than they do as a source of enlightenment. The most "educational" thing which occurs in most of our schools is the attempt of the students to beat the teacher at his own game. This can be amusing diversion. It may even be a worthwhile preparation for a congressional aspirant. But it doesn't begin to address the needs of human beings developing in contemporary America.

In a matrix characterized by massive, fundamental change, the principal task accomplished by our schools is guarantee that succeeding generations will not change in any particularly significant way. From the neat rows of desks to the dress and behavior codes to the "factual, objective, black-and-white examinations," our schools serve to inculcate a generational rigidity which may in the end serve to undo us all. Kids aren't encouraged to grow. They are "contained." Kids don't search for knowledge. They memorize the experience of their forefathers.

By the time they are "ready" for college, they are for the most part unsalvageable. The high school graduate is so bruised, so covered with scar tissue, that he cannot be open to anything. To the extent there may still be a spark of hope, our medieval "institutions of higher education" soon snuff it out. They are, for the most part, far worse than the primary schools and high schools. Professors tend to be narrow, scholarly men, totally at sea outside their minor subareas of specialization. Presidents tend to be distinguished looking fellows who have never done anything sufficiently courageous to make important enemies. Ninety percent of the trustees tend to be the folks who are responsible for 90 percent of our problems.

Education is considered to be units of material, delivered by mediocre teachers, measured in credit hours, and marked at discrete intervals by diplomas and graduation to a new stage. This may have been a valid way to train monks in the time of Thomas Aquinas, but today it serves to crush the very creativity we so desperately need. To the extent that this bill encourages that view of education, to the extent that it strengthens institutions which operate on that set of assumptions, it is contributing more to our problems than to their solutions.

Second, there seems to be an unwritten assumption throughout the text of H.R. 14753 that there is some wondrous body of information which, if only our kids could understand and memorize it, the quality of the Nation's environment would be appreciably enhanced. This argument is not totally lacking in merit. But it is almost totally lacking in merit.

Leaving aside for the moment the inner-city schools and the very rural schools—which are so horrifying in their consequences that it would be a genuine charity to the children to burn them down—the failure of the rest of the schools is not a failure to present children with existing quantities of factual information. There is certainly a crying need for sex education, but other than that we do a reasonably good job of providing students with knowledge about what we know.

The problem is that we don't know very much. We don't know the answer to the detergent problem. We don' know how to generate power without despoiling our planet. We don't know how to balance our need for food against the menace of pesticides and the environmental horror of sterile one-crop fields and nitrate poisoning.

And where we do know something, we don't know what to do about it. We know the internal-combustion automobile must be banned, that it must be replaced by other transportation systems, primarily mass transit. But we don't know what to do about it. Our railroads do everything they can to discourage passengers. Our auto companies actively discourage meaningful research on alternative transportation systems. Our petroleum companies throw up a protective Madison Avenue smokescreen, almost as thick as the one behind your car. "What can one man do, my friend?"—except howl in anguish as the jingle hums the public to sleep! We have 3,600,000 miles of roads in the country, 1 mile of road for every square mile of land, and some of your colleagues are still fishing around the old congressional pork barrel for more asphalt.

Our schools aren't telling these kids how to stop those cars, stop those ads, stop those roads. This bill isn't going to tell them. But they're learning.

That thermal inversion over Los Angeles is coming—maybe tomorrow—and tens of thousands of people are going to die. But not one element of the existing order is doing a thing to avoid it. Ten to 15 people die in New York City every day from causes related to the air they breathe. The emphysema mortality rate for the State of California has increased 12 percent a year for each of the past 20 years. And not one element of the existing order is doing anything to stop it.

It has become fashionable to write TV movies about that thermal inversion and the hopelessness of avoiding it. Our schools aren't teaching that. I suspect this bill won't be teaching that. But the kids are learning.

Education is life. A person who receives an ecological education should have learned how to lead an ecologically sound life. But, you see, that is not one of the options today. We can teach kids not to litter. Some may even prove ambitious enough to hunt around for reusable pop bottles. And a few of us will even make a point of recycling our newspapers. But it is impossible to live an ecologically sound life in contemporary America, and the root of that problem does not lie with the failure of our schools to deliver an existing body of material to the kids. The failure of our schools is much more profound than that. The failure of our society is much more profound than that.

I would like to suggest a series of alterations in the text of H.R. 14753.

The motives of those who drafted the original bill were undoubtedly good. It is an extremely broad document, which could be interpreted and implemented in a variety of ways—and many of them good. And it is sufficiently vague on particulars that it shouldn't inspire any significant opposition in an election year.

I don't think we can afford that any longer. Considering the way our civil-rights legislation is being sidestepped, I think we must muster the political courage to spell out exactly what we mean in all future legislation—and put an end to this mealy-mouthed political ambiguity.

The purpose of the following suggestions, then, is intended to flesh out the substance of the proposed legislation:

First. Section 3, part 1, lists an encouraging number of potential grantees, including public or private agencies, institutions, or organizations. I would like to see this expanded to read: public or private agencies, institutions, counterinstitutions, experimental schools, or other organizations.

An unaccredited school called The Soul Academy in Seattle is fighting a freeway proposal which would channel a stream of poisonous vehicles through the heart of that city's minority section. I, for one, contend that these environmental efforts are certainly as deserving of assistance as those of a suburban high school taking field trips to a nearby meadow.

Second. It is difficult to see how any bill can deal with environmental concerns today without dealing explicitly with sex education. This absence is indicative, I suppose, of the controversial nature of the issue, and of the fact that there is a paucity of women legislators. Nonetheless, I would encourage an explicit reference in section 2, part (b), to the need for education about sex and the population explosion.

As a footnote, I would like to suggest that some significant pressures are going to have to be applied to this sensitive area. I suspect the day is already on the horizon when significant Federal funding will be earmarked for sex education and all Federal funding will be withheld from schools which refuse to shoulder their share of this social responsibility.

Third. Virtually all of the valuable changes that have occurred in our schools this past decade have been sparked by kids. But students are ignored throughout this proposed legislation. It talks about the Commissioner of Education, about State education agencies and teachers and committee members, but the word "student" never appears.

Like most pieces of legislation, it has possibilities to be useful, depending upon how it is interpreted and administered after it is enacted. I suspect it will not be worth a tinker's dam unless you build in some very important roles for students. I propose the following:

The present section 4, part (C), should be made part (D), and the new part (C) should read: "(c) Applications from formal educational institutions for financial assistance under this act may be approved by the Director only if the institution can demonstrate (1) that students were involved in an integral manner in drafting the proposal and (2) the proposal has been scrutinized and approved by a representative group of students from the affected institutions."

Section 5, part (5)(b) should be amended so as to guarantee that at least one-quarter of the people on the committee at any time are students.

And, finally, I would like to make a rather sweeping recommendaiton. It is based upon a recognition that the facilitating structure is frequently more important than the intent of legislation. It is further based upon a recognition that the Commissioner of Education already has plenty of work to administer. It is also based on a recognition that dramatic reform is not accomplished by plugging new legislation into an existing bureaucracy, especially one which is demonstrably tried and demonstrably uncreative.

I urge that the Environmental Quality Education Act be administered by a Director, who would be directly responsible to the President's Council on Environmental Quality, but who would be chosen in an untypical way.

The Advisory Committee on Environmental Quality would be appointed, 10 members each, by the Commissioner of Education and the Council on Environmental Quality. And the Advisory Committee would then select the Director, who would also serve as Chairman of the Advisory Committee. The Committee members should have alternating, nonrenewable 2-year terms, and the Director should have a maximum term of 4 years, subject to yearly review.

Mr. SCHEUER. If the members are not renewable, don't you think they ought to be biodegradable?

Mr. HAYES. I believe most people are biodegradable.

A majority of people on the committee at any given time should be associated with educational institutions, accredited or otherwise, and at least one-fourth of the committee members should be students.

The minimum budgeted this first year under the Environmental Quality Act should be $2 billion, not more than 5 percent of which should be spendable on buildings. A goodly amount of this money should be used in adult education and community education. And much of it should be distributed through the mass media.

It is, of course, the function of Congress to allocate funds and thus determine national priorities. However, my personal preferences as the sources of these $2 billion would be from the cancellation of and reallocation of funds presently earmarked for the SST and the MIRV. Additional revenue would be generated by a 1-percent cut in the oil-depletion allowance of every oil company—such as Union and Chevron—which had a disastrous oil leak this year. And any additional funds could be drawn off the budget for the Army Corps of Engineers.

Further, I would urge that a slush fund be established, to be administered by the Director of Environmental Education, into which would be paid all fines collected as Federal penalties for illegal polluting. This would result in a couple of benefits:

Student groups would be encouraged to actively seek out and report illegal polluters.

Also, the attention of at least the educational communities would be focused on the courts to see if realistic fines were being assessed of environmental criminals.

This fund would be distributed by the Director to various groups from within the geographical area where the fines were collected, for positive programs of environmental enhancement toward a state of ecological balance.

And, if necessary, programs that are funded could be administered also to wage lawsuits against other people defiling the environment.

Some of you may view these proposals as reasonably daring. I view them as timid, pragmatic "seed" proposals. We are in a state of ecological crisis so grave that it militates against our human pride to even admit its desperation. Things are not only getting worse, they are getting worse at an accelerating rate. Our Government and our economic institutions have been long on rhetoric but short on remedies.

Far more daring than has thus far been evidenced is going to be required if we are to avert the ultimate tragedy. Our institutions have not been responsive to our needs, and they are rapidly losing their credibility. We are running out of time.

We don't have very much more time. We can't afford to give you very much more time.

Thank you.

Mr. BRADEMAS. Thank you, Mr. Hayes.

Mr. SCHEUER. Do you have copies of your statement?

Mr. HAYES. I am sorry, the reason I was late was because I was trying to dash around and get copies made, and I was unable to do it at our own office. So I went to four offices in this building, and none could make the copies for me. I do hope to do it after the meeting.

Mr. BRADEMAS. All right, Mr. Hamilton, you may proceed.

Mr. HAMILTON. Thank you, Mr. Chairman.

As high school coordinator for the April 22 day of national environmental awareness, I am most encouraged by the tremendous interest shown by schools all over the country. I am receiving an average of 200 letters per day requesting assistance in setting up activities and programs. And I estimate that more than 10,000 elementary, junior, and senior high schools will participate in some way.

This large response indicates the serious concern felt by America's youngest citizens about the problems of environmental deterioration. Many are frightented, wondering if they have much of a future to look forward to.

Chuck Karo, age 13, of Port Washington, N.Y., writes:

> I have read that many experts give us another 50 years before we completely ruin our environment. I feel the need is urgent and give my full support to April 22. What can I do to help?

And Jerry Murphy from Lansdale, Pa., requests:

> Please send me all the information you have on Earth Day. I am in the fifth grade and would like to organize my community. The teachers and adults of my area are less aware of the urgency of this problem than the children and I would like to help make them aware. I will send some money when I can.

I am glad to see so many thousands of these young people becoming actively and emotionally committed to this issue, because they represent a vast base of social and political power which will soon have to be reckoned with. And as they become aware that the ecological crisis is ultimately a matter of life and death, I think that they will demand that appropriate action be taken, regardless of social and economic costs.

I am firmly convinced that environmental quality cannot be bought, no matter how much money might eventually be spent. Antilitter campaigns, improved sewage treatment facilities, mandatory smog-control devices on factory stacks and auto exhaust systems are important. But these are not more than piecemeal solutions to the problem. If today's young people are to have a future worth living, some very fundamental and radical changes must occur in the social fabric of this Nation. Deeply imbedded values and attitudes must be reexamined and updated.

Coleman McCarthy of the *Washington Post* recently said in one of his columns:

> The one thing needed to recover and preserve the American environment is exactly the one thing money, programs, and Presidents cannot instantly effect among the people: a reverence for the earth. This reverence, in its simplest form, means paying fair homage to the soil, the winds, the waters, and honoring the very spirit of their places.

And an editorial in the *Post* a week ago today said: "Americans may have to stop living so well if they wish to stop polluting so much."

The same editorial concludes with the following somber, but I think valid, assessment of the situation:

> Thus the prospects for balancing our ecology are even bleaker than originally suspected. Government policy, court-imposed fines, new technology, the overnight growth of a pollution-control industry—one of these can avert ecological disaster alone; the problem goes beyond politics and technology into the social and psychological parts of Americans. This is what politicians and other leaders should begin talking about: that the environment will not be saved—and ourselves with it—by some kind of vague collective concern. It will be saved—if it is saved—by specific, individual sacrifice of personal comfort and economic growth. This is a dismal thought, perhaps, but easier to live with than the environment we will encounter in good time if we do not face up to it.

Amen! Individual sacrifice of personal comfort and economic growth—this is where it's at. And what disturbs me is that practically no one in government and industry, the centers of power and influence in our society, are addressing themselves to this basic notion. Instead, they are busy counting up how many dollars and how many votes strong antipollution measures would cost them. Meanwhile, the frustration and anger of the young people whose lives are in jeopardy continues to grow.

Bold action and strong leadership are needed on all fronts—government, science, industry, education. Now. There isn't time to wait for a future generation to move into decisionmaking positions. By that time it will be too late.

Making environmental understanding an integral part of our educational system, particularly at the elementary and secondary levels where attitudes are formulated, is, in the long run, the major hope in saving ourselves from ecological disaster. All instruction should be based upon the understanding that man, as a biological animal, is but a thread in the intricate fabric of nature and that his existence on this planet is tenuous and totally dependent upon highly integrated and fragile forces, any one of which, if sufficiently disturbed by man's lack of reverence, could lead to the extinction of all life. Young people must be made sensitive to the act that our spaceship earth is a finite planet with a finite amount of rapidly diminishing resources, resources which must serve not only or own, but future generations. They must be taught to lead ecologically sound lives.

The whole bit about money and position and material wealth as the goals to shoot for in life must be abolished if we are to have a chance. I recall just a few years ago when I was in high school being told by teachers and counselors that society was very competitive and that to get ahead, land the best jobs, and make the most money, it was imperative that I make good grades. I and many young people today categorically denounce this "get ahead" ethic as anachronistic and terribly dangerous in today's world. The mad pursuit of money and material wealth must be replaced with the desire to live in harmony with nature and to experience the peace of simple natural living. Students should be led to discover their senses, to find the fulfillment that comes from self-expression and individual creativity and music and watching sunsets and sleeping under the stars.

Environmental education goes far beyond the realm of conservation and outdoor education and restructuring biology. It calls for a different life style. To me this is our only hope.

The stated aim of H.R. 14753 is "to establish educational programs to encourage understanding of policies and support of activities designed to enhance environmental quality and maintain ecological balance." I think that this goal should be made a national priority. With this in mind, I offer the following suggestions about the bill and environmental education in general.

First, because of importance, the necessity of population control should be fundamental to all environmental education. Without it, the noble idea of ecological balance is unattainable. All young people must be made to realize that it is socially irresponsible to have more than two natural children.

Second, I advocate that a proportionately large share of the funds appropriated for H.R. 14753, if it becomes law, be allocated for teacher education, because they are the key to success for any environmental education program. Until instructors feel the interrelationship of all living things, of which I spoke earlier, until they feel the necessity of changing attitudes and living less affluently, any curriculum materials and programs will be just so many words. As soon as practicable, I think that states should require all teachers, K–12, to complete a certain amount of environmental coursework before becoming accredited. Also, a national campaign of evening classes, weekend seminars, and summer workshops should be instituted to train teachers already in the classroom.

Three books brought me a long way toward my current thinking about the environment, and I recommend their widest usage, both in teacher education and in the classroom. They are: Erlich's "The Population Bomb," Renos' "Moment in the Sun," and Dubos' "So Human an Animal."

Third, from past experience I have discovered that one of the best ways to break the barriers of apathy and ignorance is through the use of audiovisual methods. Many excellent films dealing with the various aspects of environmental deterioration are currently available. I recommend that a selected panel choose a dozen of the best films to be reprinted in quantity, highly publicized, and made available free of charge to schools and community groups across the country. Provision for this could perhaps be made by an extension of section 3(5) of this bill.

Fourth, an addition to the bill that I strongly urge is a provision to set up, on a statewide or national basis, a central repository of environmental-education information. A lot of excellent material is available today that, unfortunately, very few people are aware of.

Fifth, environmental education should deal, whenever possible, with local environmental problems. Taking a local pollution inventory, researching the problems, and coming up with alternative solutions, for instance, would make the learning process relevant and exciting, something that can rarely be said for most classroom situations today. All students should discover firsthand the operation of water purification and sewerage-treatment facilities in their communities and should know how solid-waste disposal is handled. Equipment should be made available, perhaps through an extension of H.R. 14753, for measuring air-and-water quality—another example of relevant learning that chemistry students would eagerly enter into. I think, too, that selected students should be allowed to do full-time research, under faculty supervision, of environmental problems. Second-semester seniors, who often have little to do anyway, could personally benefit from independent study and could pull together valuable data for the school, community, or public agencies.

Sixth, the establishment of student ecology clubs should be encouraged. These clubs can serve a vital function in carrying environmental awareness to the community through activities such as ecology fairs, seminars, film-showing, student-edited eco-newsletters, the initiating of consumer boycotts, distribution of petitions, and students themselves speaking before community groups and elementary classes.

Seventh, there has been some talk about establishing an Ecology Corps patterned after the Peace Corps and VISTA ideas. If this does come into being, I think that members could, if adequately trained and motivated, be extremely valuable in promoting environmental education and sensitivity, both in the schools and at the community level. They could research local environmental problems, give speeches and classroom presentations, arrange field trips and pollution tours, coordinate the obtaining and distribution of films and written environmental materials, and serve as catalysts for student and community action to fight environmental deterioration.

Eighth, one final reservation about H.R. 14753. I am a little worried about section 5(b). It states that the 21-member advisory committee "shall consist of persons familiar with education, information media, and the relationship of man as producer, consumer and citizen to his environment and the Nation's ecology." I guess that could include just about anybody. The membership of this group is critical because it will determine the types of programs that get out to the field. I just hope that it is not predominantly comprised of PR types, businessmen, and old-line educators. There is great need in this endeavor for fresh ideas and new approaches, and I hope that ecologists and young people are well represented among its membership.

With the additions and reservations that I have mentioned, I think that H.R. 14753, if adequately funded, can be a significant step forward in the attempt to bring man back into harmony with nature. The harmony I speak of can be achieved only through attitudinal changes, and education is what changes attitudes. I just hope that it is not too late.

Thank you.

Mr. Brademas. Thank you very much, you two gentlemen. Thank you both for your interesting testimony.

Mr. Hayes, I note in the current issue of *Science* magazine, a publication the American Association for the Advancement of Science, you were quoted as saying:

> Most of the politicians and businessmen who are jumping on the environmental bandwagon have not had the slightest idea of what they are getting into. They don't realize that we are going to need values.

I daresay that may be the case—and I have not taken a Gallup Poll on that issue—but, for your own information and edification, let me tell you that it was precisely because of the conviction on the part of members of this subcommittee and sponsors of this bill, three of whom are here today, that on yesterday, when we opened our hearings on this bill, we heard from an outstanding theologian and also from not only one of the leading painters in the United States but, one of the most distinguished painters in the world today, Dr. Sittler and Mr. Motherwell, respectively.

Not intending to joust with you but simply to reassure you, I think I do not misrepresent the views of Mr. Scheuer and Mr. Hansen when I say that all three of us feel very strongly in accord with what you suggested—that unless we can help bring about some shift in attitudes toward society and toward human life, toward short values, we are not going to make much significant headway, no matter what kind of legislation we may produce here. However, it is at least in part to move in that direction that we have put this bill together.

Mr. HAYES. Mr. Chairman, for your information and edification, I received a phone call shortly after that article appeared from Luther Carter, the author, apologizing profusely for the way the quotation got so jumbled in the wire. It is almost impossible to refute an incorrect quotation in a mass circulation magazine when the author doesn't intend to do it, because it happens enough that he does intend it.

The point I wanted to make is this: a great many people are looking for solutions by technological changes, to problems which have their roots in misplaced values. We have to create new options, and encourage people to explore them.

Mr. BRADEMAS. I think we are in complete accord on that point.

Might I also say that while I sympathize with your criticisms of much of the American educational system, I would hope that this modest vessel that we have set afloat into the sea will not be expected to bear the whole burden of reforming and revolutionizing the American educational system. That might be hopeful if we could do it, but I won't want to weigh it down too heavily.

With regard to your statement that the bill is based on the present supposition that "there exists some wondrous body of information," to quote you, "in the field of environmental studies," it is, I think, somewhat exaggerated.

I do think that one of the principal purposes of the bill is, as it says, to encourage the development of new and improved curriculums in this field. I don't think those of us who put it together pretend to be ecologists, nor do we certainly pretend to know exactly what ought to be taught. But we want to give encouragement to finding and developing effective curriculums, and I was struck in that connection by what Mr. Hamilton said to the effect that there, to quote him, "exists a lot of excellent material available today."

I also appreciated some of your specific suggestions, Mr. Hamilton, in connection with ways in which we might change the bill, your strong emphasis on teacher education and using audio-visual methods to establish a student ecology club or clubs.

Can you tell me, in your judgment, if you have been able to build across the country some kind of network, either at high school or college level, of ecology clubs? Are these aborting at this point in time, or how do we stand in this respect?

Mr. HAMILTON. At the high school level it is growing at a great pace. A lot of groups are organizing to plan programs for April 22. These groups are being set up as ongoing ecology clubs in the schools.

Mr. BRADEMAS. What do you think, Mr. Hayes, is going to happen after the 22d of April? Will this be a one-shot expression of student interest in this matter and then they will quietly fold their tents and go back home and we will hear nothing much more about it? Or do you think that the commitment to concern themselves about environment is profound and wide enough among university students that there will be significant followthrough after April 22?

Mr. HAYES. To address myself briefly to both questions, Mr. Chairman, I guess one might term the groups that are forming in colleges and in community "ecology clubs"—a lot of them are concerned with something a bit more specific than that name tends to imply. They are conducting investigations of those people and institutions contributing to the degradation of life.

I think such groups are providing, in educational institutions and in the mainstream of society, some kind of a point around which other people can rally. They are going to be doing the basic organizing, the "busy work" of getting things off of the ground. But the range of concern extends far beyond the parameters of these existing organizations.

The second question about this being a one-shot deal, is the question I most frequently encounter. It seems to be on the lips of every reporter. The media tends to go on the basis of fashion, something is fashionable one period and then something else in another period, and what is fashionable gets covered.

There is thus a presumption on the part of a great many people that student interest over civil rights and civil liberties and equality of education has died out. That is wrong. If you look into the real records of what is occurring on campuses, not what is published in newspapers, but rather at the number of disturbances which took place in the last 4 months, I think you would be amazed. If this had occurred year before last, it was front-page news at least once a week, but this year it is not the fashionable thing. So the students and their concerns are ignored.

The same thing can be said for the war. A lot of kids are sufficiently frustrated and disenchanted with bringing about meaningful changes in the context of the existing order that they have given up the kinds of activities they had been doing before. Now they sit around coffeeshops and around their own homes, sort of discussing their inability to have an impact on that range of decisions. The issue, however, has not been dropped.

With regard to the environment, I think that the probabilities of this being a fad are even less than they are with those two issues. This can't be a fad, because, as I remarked, I think at one place in the text, things are not only getting worse but are doing so at an accelerated rate. We have catastrophe after catastrophe after catastrophe, and the people that are going to be the prime losers in that set of occurrences are going to be the young, the people who want to live in this country 30 years from now, but find themselves with the prospect of facing an uninhabitable planet.

Emotions are running high. Just take the kind of advertising that is coming out. You see full-page glossy ads which are absolutely disgusting in the way they deceive people. That money could be invested in something which would be a bit more useful in terms of enhancing the quality of the environment, not just the beauty of some of the pictorial magazines.

We have seen little indication that society is beginning to recognize the error of its ways and to begin to turn around.

In brief, this is not a fad. The 22d is a beginning for us as an organization and, I think, a beginning for the youth of the country, not just students, but the youth of the country, as the environment as a significant issue.

Mr. Brademas. I am very encouraged to hear that response, and I am impressed by what both of you have said in respect to the importance of our seeking to shift values in this country if we are going to make some substantial advance in keeping with this problem.

Thank you very much.

Mr. Hansen?

Mr. Hansen. Mr. Chairman, thank you.

I thank both of you for very pointed statements.

I have just a couple of questions I would try to direct toward the principal criticisms in the matter of the bill. I believe you characterized one as embodying a hopelessly outmoded, archaic concept of an educational system. And I am wondering, with all of the very constructive suggestions you made for changes in the bill, if, in your judgment, this really corrects the major defects that are there.

Mr. Hayes. If the rather sweeping suggestions I made at the end of my statement about the fundamental reorganization of who is to administer the bill, and the appropriate level of funding, and the kinds of institutions that would be the beneficiaries could be adopted, I think it would cause an enormous change for the better in the existing educational system. I think it would be enormously beneficial. My concern is that it will either be inadequately funded, or the money will go to the wrong institutions.

Mr. Hansen. My second question relates to the other criticism directed toward the bill. And that is, I believe you described it as:

"We don't really know enough, and the bill assumes we have a great body of knowledge."

I think when we try to develop a new program such as this, we are faced with this question: Do we know enough? Should we wait until we learn more before we make a beginning?

I would readily concede there is a great deal to learn. But, we know a great deal and a lot of it is really not too complicated. We know a lot about the earth. We know about nature. We know that pollution kills life, and we know what causes pollution, and we know many of the effects of pollution.

I was very much impressed by Miss Buxbaum's description of her experience in Nevada this past summer. And I was impressed with the amount she had learned, which will put to very good use throughout a career which she has chosen for herself.

Now my question is, really, Don't we know enough that we can't afford not to wait to disseminate the knowledge that we do have and in trying to learn as we are moving forward with programs such as are envisioned by this bill?

Mr. HAYES. Yes.

The point I am trying to make is not that the body of information where we do have some tentative conclusions should not be presented for analysis in the classroom, but rather that the fundamental process of education is an organic experience. The individual, by going out and experimenting and making mistakes and coming into direct contact with a series of situations, adopts a set of mental ideas, attitudes, shifts of beliefs in values, which become the most critical elements in his total life style. The adoption of a given body of material, which is simply the memorization of facts, such as the facts about earth or the facts about war, constitute a reasonably unimportant part of the behavioral mechanisms. And in most cases people tend to forget rapidly.

I went through quantitative analysis and chemistry, and I have forgotten 98 percent of the equations I learned. Most of my formal education has had little impact on my values, or on the way I lead my life. My fear for the bill is that it seems aimed too much at academic ends, and too little at living educational ends.

The bill might act to set up new departments in existing institutions, but what we really need is a new set of institutions. Many of our most important educational institutions—the family, the church—are losing their impact, and nothing is replacing them.

That is what we call for, for a list of institutions to receive funds for a new era of education, an organic growing kind of education, as opposed to an information-transfer kind of academic training.

Mr. HAMILTON. Might I say, from what I mentioned about the feeling for attitudinal change being the root of this whole thing, I think there is enough information available now that we could really make, you know, a big step forward. I think what we have to do is get teachers to realize kind of what I was talking about, the reverence for nature and everything. But if people believe, as I strongly do, the need for population control, the need for less affluent living, the need eventually for mass transportation, the need for not utilizing so much electricity, and then what does it mean, you know, less electric appliances and a lot of conveniences which we have nowadays—I don't know how much more we need to do about it.

We know this is what has to be done, therefore. It is attitudinal, and we have to get the teachers to feel the urgency the way I do and many people do.

I think I could go into a classroom and do a lot of the work that needs to be done, not having had any teacher training or anything in my background, just because I feel strongly about this issue. I think we have to get the teachers feeling the same way.

Mr. HANSEN. I will say I couldn't agree more with a great deal of your testimony on really what the root of the problem is. The more we identify the root of the problem as being one of need for attitudinal changes, the more I am impressed that the solution is not legislation, that the legislative role is a limited role. But it is the kind of changes in our society and in our system of values which must be made.

Mr. **Brademas.** Mr. Scheuer?

Mr. **Scheuer.** I want to thank you both for your remarkable and stimulating testimony. I could question you for the rest of the day on it, which I assure you I won't do. But it has been an intellectual pleasure to listen to both of you.

Now, because of the time—and we are functioning illegally now, because we are not supposed to hold hearings after the noon bell has rung——

Mr. **Brademas.** Unless it is made a point of order.

Mr. **Scheuer.** Unless it is made a point of order.

The things that concerns me about the whole effort of the environment is the lact of community and political followup. I was at that UNESCO conference that Mr. de Bell discussed before. And before I went, I circulated a draft of this bill which we were developing to everybody who participated in that conference. And I got all kinds of suggestions out there regarding the technical aspects of the legislation, but not one suggestion that we should make a reference in the bill to community and civic action, involving the churches.

I don't know whether I caught you correctly when you talked about the churches collapsing. But in my view, I can't remember a time when the churches were going through a more agonizing effort to be relevant than they are now. I would like nothing more than for this bill to provide that churches can get some funding for community education and action programs in the environment.

This morning I have been sitting here somewhat disturbed. No one talked about what we are going to do about what we do know. And I agree wholeheartedly with Congressman Hansen that while we don't know it all, we know enough to begin to apply in the world some of what we know.

It seems to me that if this message should come from anybody, it should come from the activists, who ought to be distressed that while we don't know it all, we are not beginning to apply what we do know.

Would you have some suggestion to us as to whom we can fund some legitimate, constructive action programs? And, of course, they would have to be nonpartisan or bipartisan. They couldn't be political; but there certainly could be community action programs to identify and bring public pressure on polluters, to investigate every aspect of the impact on the environment of both government and private sector programs.

Would either of you have suggestions how this bill could stimulate action or result oriented programs which are civic and community—and neighborhood—oriented?

Mr. **Hayes.** There seems to be a little confusion in terminology. I think you were involved in a couple of conversations during my testimony, and that might be the root. And I, unfortunately, was unable to give you a copy of the testimony at the time. The prime thrust of what I said was, that so long as we viewed the educational process which takes place with regard to environmental concerns as one which transfers information between teachers and students, then we are still only talking about a solution being 12 years in the future for a problem that should have been solved a decade ago. That won't do. We have to involve society now! We need a different range of institutions than what the bill addresses itself to.

I gave a range of other possibilities. They include things such as counter-institutions, such as free schools. I don't know if you are familiar with what that term implies, but they are what you called "civil-social action groups." They are concerned with the grass roots. An organization in Palo Alto is trying to build a coalition of rich conservationists, low-cost housing people, people concerned with the establishment of a military research park on university lands. All have a central purpose of challenging in the way that Stanford University had invested in its lands. They are saying to the university:

"You have one basic resource. You are the biggest land holder in the area, and you should serve the interests of society. We would suggest, instead of going ahead with your intended development, that you adopt this counter-proposal."

That is the kind of thing that is occurring across the Nation, but which is in dire need of money. Now, this can be overdone. There is nothing you can do to a student organization that would be more disastrous than to give it, for example, $100,000 for a project costing $15,000.

Mr. Scheuer. Well, if they don't have the money to pay the people to do the organizing, that would hurt.

Mr. Hayes. Well, they should at least have a mimeographing machine. And in case after case they have been completely stopped because they were unable to get a few dollars here and there. With our organization presently involved in environmental action, I think we are doing something which is going to have as profound impact on this society as anything that occurs this year.

I can think of nothing more critical than to bring to the people the kinds of programs we are trying to get across. We don't have money. We are several thousand dollars in debt, and I don't see any grantees on the horizion. This kind of program, which does not involve major universities or State school systems, not established ways of dealing with things through normally established mechanisms, but simply the ones we are making today, simply does not "qualify" in the eyes of those who have money.

With particular regard to funding, I would like to urge that your program not be administered by a Commissioner of Education or the Department of Education. Once you do that, you are plugging everything into a whole system which does not function. You have to create something new, and I think the ideal place is something underneath the Council on Environmental Quality.

Mr. Scheuer. Well, let me put my question mark after that. Normally, in this bureaucratic area, which we call Washington, D.C., when a fellow gets a title and an office and a phone and a secretary, he then carves out as big a hunk of turf as he can for himself. This is the bureaucratic warfare that goes on. And if a fellow wants to be effective, he carves out his turf and then starts planting seeds.

One of the first things the Chairman of the Environmental Council said was that he didn't know what his jurisdiction was, he didn't know where his jurisdiction and the executive branch's ended or started. And he thought it would take months, if not years, for people to figure that out. And it gave me a lack of confidence that he was really in there to fight for a place in the sun for the environmental concern. And in the executive department, where we have a Defense Department, an Agriculture Department, a Commerce Department, HEW, and Labor, where we desperately need an agency that will provide some kind of oversight. The Chairman seems to be wondering where to start now. And if you are looking for somebody to challenge the institutions, I don't have any evidence before me up to this time that such leadership is presently residing in the Environmental Council.

Mr. HAYES. I do not want to get involved in any question of personalities. I think probably what would be desirable would be to bring in a new personality who, in terms of a bureaucratic structure, would be subordinate to the structure but will largely not have to answer to it. I think there should be young people definitely involved who are able to relate to other young people where they are, the younger people under 30 in this country, or whether he is under 30 or not.

As far as having this office under the Office of Education, all of you now involved in this committee know it is one gigantic SNAFU. It would take several years to try to curve any autonomy out for something within OE, if indeed it would be possible at all.

There has to be a noninstitutionalized way of proceeding with these matters. It is necessary that you don't build a perpetuating mechanism into the system. Whenever we have a fellow who is primarily concerned with maintaining his job, then we have trouble on our hands.

Mr. BRADEMAS. Thank you both, once again, on behalf of all of us. And we wish you well in your teach-in on the 22d of April.

Now the subcommittee is adjourned until 9:30 tomorrow morning, when we will meet in room 2261. And, as I said earlier, we shall hear from a number of people from the University of Wisconsin and others.

(Whereupon, at 12:30 p.m. the subcommittee recessed, to reconvene at 9:30 a.m. on Thursday, March 26, 1970.)

ENVIRONMENTAL QUALITY EDUCATION ACT

THURSDAY, MARCH 26, 1970

House of Representatives,
Select Subcommittee on Education
of the Committee on Education and Labor,
Washington, D.C.

The subcommittee met at 9:30 a.m., pursuant to recess, in room 2261, Rayburn House Office Building, Hon. John Brademas (chairman of the subcommittee) presiding.

Present: Representatives Brademas, Steiger, and Hansen of Idaho.

Staff members present: Jack G. Duncan, counsel; Ronald L. Katz, assistant staff director; Arlene Horowitz, staff assistant; Toni Immerman, clerk; Maureen Orth, consultant; Marty L. LaVor, minority legislative coordinator.

Mr. **Brademas**. The subcommittee will come to order for further consideration of H.R. 14753, the Environmental Quality Education Act.

The Chair would like to observe at our hearings today that we next plan to conduct hearings on this bill here in Washington on Tuesday, April 7, then on the 8th and 9th. We then expect to have a day of hearings in New York City on Saturday, April 11. Toward the end of the month we plan to conduct hearings outside of Washington in Idaho, California, and Texas, with specific announcements on dates and places to be made later.

The Chair would like to recognize a distinguished member of the subcommittee, the gentleman from Wisconsin, Mr. Steiger, to present the first witness.

Mr. **Steiger**. Thank you, Mr. Chairman. I am particularly delighted to have the chancellor of the University of Wisconsin at Green Bay here. Chancellor Weidner achieved, I think, both for himself and the institution, in a very brief amount of time, a nationwide reputation for concepts that he discusses in his statement.

I am very pleased also he has included as one of his appendixes the text of the statement that he gave at the conference on higher education in Chicago, which he shares the panel with Senator Henry Jackson and Ralph Nader; so I am delighted to have the chancellor here and have him proceed in any way the Chair wishes.

Mr. **Brademas**. Come right ahead, Chancellor; we look forward to hearing from you, sir.

STATEMENT OF EDWARD W. WEIDNER, CHANCELLOR, UNIVERSITY OF WISCONSIN, GREEN BAY

Mr. Weidner. Mr. Congressman and chairman.

Mr. Brademas We understand you have been flying most of the night, and we appreciate all the more your making the effort to be with us.

Mr. Steiger. Was it snowing in Green Bay or Chicago?

Mr. Weidner. I had the intelligence of avoiding Chicago, sir; and I managed to find snow in Grand Rapids, Lansing, and Detroit, Mich., and on an overnight spot along the way.

Mr. Chairman, we are in the midst of an ecological crisis. Both city and countryside are spoiled. Both air and water are polluted. Everywhere we look, man's abuse of his environment is evident.

We have all been alerted in recent months to the problems of our environment. The President has spoken out clearly. The Congress has shown in various ways in the past year or so that its Members are increasingly sensitive to and concerned about the very real problems of the environment that confront us on all sides.

We are about to experience, on April 22, a national teach-in on the environment. My own campus at the University of Wisconsin—Green Bay will be taking part in that teach-in with a rather ambitious program.

The awareness of the crisis now sweeping our society is all to the good. Without such awareness, there would be no hope of mobilizing the great concentrations of resources and manpower that are going to be required.

Few, if any of us, however, can have any accurate concept of the effort, the ingenuity, the determination, and the cost that will be required to translate this awareness into effective action in support of environmental quality. The reason is that we are dealing with a situation that requires us to abandon or substantially modify certain attitudes and beliefs that have been a part of our conventional wisdom for generations, even for centuries. To mention a single and extremely troublesome example, there is the problem of population control. You are all familiar with its ramifications. They read into every area of our lives, including the most personal. If basic changes in our individual and societal attitudes in this area are to be made, we face an educational task that dwarfs anything we have accomplished in the past. The size of the task is amplified by the limited time we have to accomplish it.

While population control may be the single most difficult problem we must face in the immediate future, there are others that are not far behind it in magnitude and complexity. Some problems, such as war and poverty, are very old and may not at first glance appear to be environmentally relevant. But we are beginning to see such social phenomena in a new context, as contributing to and being affected by ecological factors.

Conceivably, this new way of viewing our situation could lead us to solutions not apparent before. The ecological view does reveal the inescapable relatedness of all of us with each other and of man and his works as a whole with the biophysical environment that produces and sustains life.

In this formulation, you will recognize overtones of the great religious and philosophical concepts that form the heart of our cultural heritage. We are not discovering new truths about the requirements of our existence, except perhaps in a technological sense. But we are rediscovering with great urgency that application of the old truths to the realities of our environmental situation may quite literally be the price of our survival. Because this discovery seems to be taking place on a national and even on a world basis, I am convinced that we are entering on what will prove to be the most hopeful and creative of the ages of man.

Let us now turn from general philosophy to specific example. What are we trying to do at the University of Wisconsin—Green Bay? Our mission at Green Bay is nothing less than to create a new kind of educational institution, a university designed specifically to respond to the needs of an area which will have as its dominant concern the preservation and improvement of environmental quality for all men.

Institutions are essential to the carrying on of our societal business. But institutions, including those devoted to higher education, can lose touch with the times. They tend to continue to respond to the needs for which they were originally created, even after those needs have disappeared or become substantially modified.

When institutions get too far out of tune with current needs, they may steadily decline, or they may renew themselves. In either event, a rather violent and painful social process is involved. That is exactly the process into which our institutions of higher education have been plunged in recent years.

For the most part it has been the students who have forced them into this process, because it was the students who were the first to see that the education they were being offered was only marginally consonant with the great needs of the world in which they were about to become responsible citizens.

A consistent theme during these past few years of campus turbulence has been the student demand for relevance—relevance of what is taught in the classroom and laboratory to what is going on in the rest of society.

I have already referred to the University of Wisconsin—Green Bay as a new kind of educational institution. It may be the only university in the country to be planned from its inception as an institution consciously focusing in all of its parts on problems of the environment. Although our academic plan with its pervasive ecological emphasis became operative only last fall, its formulation began 3 years earlier, long before the public at large had been made aware of the seriousness of the ecological crisis.

I mention this fact simply to emphasize that our plan is not a patchwork strategy thrown together in hasty response to a popular outcry for doing something about the environment. Naturally we welcome the outcry and the concern that motivates it, but, had it not occurred at this particular time, we would still have been embarked on precisely the course we are now following.

Obviously there was a certain amount of foresight involved in our planning, but it was foresight for which no single individual or small group of individuals can take credit. Our plan, which is still evolving, represents the collective contribution of hundreds of persons, including not only educators and scholars from throughout the country, but many of the business and professional men, political leaders, and other citizens of Wisconsin and its neighboring States—and, of course, our students as well. Full credit must go, also, to University of Wisconsin President Fred Harvey Harrington and his staff at Madison, to the board of regents of the University of Wisconsin, to the State's coordinating council for higher education, and to the legislature for their collective willingness to consider, approve, and fund a new institution that departs radically from the established patterns of public higher education.

The details of our academic plan and institutional organization are adequately described in a number of appendixes which I am submitting as a part of the formal record of my appearance before your committee. These appendixes include a statement of philosophy—exhibit A—a summary of the University of Wisconsin; Green Bay academic plan—exhibit B—a statement of UWGB's major emphasis which I made earlier this month at a meeting in Chicago of the American Association for Higher Education—exhibit C—and a brief description of our colleges and the curriculum concentrations, which are environmental problem areas, for which each of them is responsible—exhibit D.

These documents constitute an expression of institutional purpose that is attracting considerable interest in the media and among other colleges and universities that are seriously concerned with their own possible responses to problems of the environment.

Mr. Chairman, the experience of the University of Wisconsin—Green Bay the last 4 years clearly indicates that the objectives you seek through H.R. 14753 are both urgent and attainable. Ours is a university with all its curriculums designed to encourage preserving and enhancing environmental quality and ecological balance. Our objective is not to train narrow specialists but to extend a broad, general education on environmental quality to all students, regardless of their fields of specialization or their professions.

In order to attain this end, certain requisites are evident. First, fundamental to our program at the University of Wisconsin—Green Bay is the conviction that our mission can be accomplished only in concert with the people of our region as they act through their business and industrial enterprises, professional organizations, and governmental and voluntary agencies.

We have already established a variety of community advisory committees that regularly provide counsel and stimulation for our several colleges and campuses and for the university as a whole. The community joins us on the campus, and we of the campus join the rest of the community off the campus in mutual learning experiences.

Second, environmental problems do not recognize political boundaries. Most such problems may be local in origin, but they affect entire regions that are defined in part by natural features and in part by manmade features.

Our region is the upper Great Lakes area. We see ourselves as being in a position to play a unique role in focusing the attention and the efforts of students, professors, and other citizens on environmental problems that are regional and even superregional in extent. This regional role may well be a prototype for other institutions.

Third, the ecological crisis is not one that has been brought on primarily by lack of scientific and technological knowledge. The crisis is rooted in attitudes that have allowed all of us, in our business, industrial, domestic, and recreational activities, to do things that have had a cumulative and massive degrading effect on our environment.

The great need is for a new set of attitudes that will enable us cooperatively to apply to the improvement of the environment the scientific and technological knowledge that is available to us. This is the objective of the general education element of our university work.

Fourth, there is widespread recognition today that the traditional organization of educational institutions into narrow disciplinary departments is not well suited for mounting an educational effort directed to the solution of environmental problems. It is much easier, however, to recognize these organizational defects than to change them. There is a relearning process involved for virtually all faculty members, most of whom have themselves been trained rigorously within particular disciplines and have become accustomed to functioning within traditional departments.

Undoubtedly, this relearning process can best be carried out in a new institution that has deliberately structured itself along lines that encourage the intermingling of disciplines within relatively broad environmental problem areas. For that reason, I would think it particularly important to direct support to universities that are in a position to address themselves to an institutionwide approach to ecological studies.

Let me conclude by emphasizing that the theme of man and his environment is not a fad for a university. It is not just a fancy "add-on" to permit an institution to appear contemporary or to assist it in attracting outside funds.

Rather, man and his environment must take its place as a fundamental aspect of the curriculum of every university that seriously concerns itself with the future of mankind.

(The documents referred to follows:)

EXHIBIT A.—A STATEMENT OF PHILOSOPHY

(Excerpt from the 1970–71 catalog of the University of Wisconsin-Green Bay)

Meeting the challenge of a new generation of youth who will not be denied less than they have been encouraged to dream: this is the task that The University of Wisconsin-Green Bay has set out to accomplish.

Proceeding from the beliefs that a university cannot operate in a vacuum and that to be alive and effective it must demonstrate imaginative leadership, UWGB has implemented an academic plan that relates the student to the modern world, a plan that attempts to combine the world of books and experiences in such a way as to make the student feel his wholeness—feel that what he is learning and what he is doing have a unity and integrity validating their relevancy.

The contemporary student

The plan begins with certain assumptions about the contemporary student. First of all, he is more capable, brighter, possessed of more knowledge, and the product of a better educational system than the students of his parents' day. His advantages do not stop with higher scores on intelligence and achievement tests. He is both more cosmopolitan and more concerned with normal values.

He has been raised in a society of shrinking dimensions, of instantaneous communication, and rapid world-wide travel. The isolationism of his parents' day is anachronistic to him. He has studied about many nationalisms, competing economic and political systems, and religious, racial, and ethnic groups. If nothing else, he has seen it all on television, read about it in newspapers and news magazines.

He has reacted negatively to the kind of education offered on some campuses. He sees faculty members as not interested in and often avoiding the things that he feels are relevant. He wants to participate in the larger community at the same time that he is receiving an education at the university. Frequently his efforts have been greeted with skepticism. Perhaps in part as a result of frustration, he has turned on faculty members and members of the larger community and has charged them with being uninterested in the major problems of the day. On occasion, he has suggested that traditional university and community concerns are outmoded in the new society that needs to be created.

In shaping an academic plan for the new university which first opened its doors as a degree-granting institution in the fall of 1969, the UWGB faculty and administration took up the challenge of the contemporary student. They began questioning established modes of behavior and traditional approaches to university education. They wished to relate university education to the world of today and tomorrow, without turning their backs to the lessons of the past. They recognized that, if action were not taken soon, society seemed destined for an intensification of intellectual isolationism on the part of the university, a cultural parochialism on the part of the larger community, and an oppressive approach to ideas on the part of both.

The "communiversity" idea

UWGB's chancellor, Edward W. Weidner, expressed these ideas in a 1969 commencement address at Northern Michigan University. "We are in great need of a new concept of the socially responsible university to help create or contribute to the socially responsible individual and community," he said. "It is time to take a positive creative approach to relating a university and a university education to the larger society."

"To meet these objectives," Chancellor Weidner continued, "I propose that we move firmly and rapidly in the direction of a communiversity. A communiversity is a socially responsible university relating to a socially responsible community. The word university stems from the world universe. Too frequently, the universe has been interpreted by universities as relatively ideal to the degree that the institution manages to separate itself from the community. The communiversity defines the universal character of the institution's concern in different terms: by application of its resources to the living-breathing community of which it is a part."

Guidelines for an academic plan

This basic philosophy guided the formulation of the UWGB academic plan. Its principles and objectives are designed to facilitate a close interweaving of university and community. The most important bases of this academic plan are:

1. *Devotion to excellence.*—The road to social improvement and social survival necessitates tapping the spiritual, intellectual, and physical resources of human beings far more fully than has been the case in the past. The goal of excellence is for all members of society, not just for the few directly associated with universities.

2. *Commitment and dedication.*—These are not simple concepts. They also involve sacrifice, discipline, a freedom from restraint, and an expansive or experimental spirit.

3. *Involvment.*—Each individual and group must be involved in the process of education. The curricula in higher education should not be as prescribed as they have been. They should be flexible and should extensively involve each student in developing his own curriculum in his own way. The same principle extends to the large community. All elements of society should be involved in considering the need for broader social change and undertake it.

4. *Accessibility.*—To be effective, this means a thorough and continuing two-way dialogue between and among students, faculty, and administration.

5. *Relevance.*—A crucial additional dimension is added to academic experience by relating higher education to today's society. As Chancellor Weidner puts it, "Liberal arts education has often been too general. It has been all things to all people. It often has ignored cultural differences. It has frequently been aloof

from the world. On the other hand, applied or professional education has often been nuts and bolts oriented, concerned with routine and detailed procedures or methods.

"Those seeking a relevant education have attacked both the traditional liberal arts and traditional professional education. Yet the criticism has often gone too far. Those emphasizing relevance have sometimes suggested that history can be ignored, that anything that is not contemporary is not relevant.

"This is patently false. Nearly all subjects in a university's curriculum can be made relevant to today's problems. Certainly history, philosophy, and literature can contribute as much to our understanding of the world as chemistry, biologoy, or economics. They can be made relevant, but they are not necessarily so without conscious adaptation or effort.

"Faculty members and students must cooperate in designing approaches to such subjects with relevance in mind. A university education that is relevant can result in far higher student motivation. It can result in far more understandable relationships among the several disciplines. It can help bridge the gap between the university and the outside world. It can lend a new element of excitement and meaning to higher education. But relevance does not mean putting aside everything that is not contemporary."

6. *Devotion to problem-solving.*—Sharpening the student's thought processes and helping him examine his values are basic responsibilities of a university. But liberating the student's spirit is fruitless and even dangerous if at the same time the problems brought into focus by values and thought processes are not grasped more effectively. The relevant curriculum heightens the meaning of higher education by leading to a renewed emphasis on problem-solving and creating a habit of mind that is usefully extended to the community at large.

This then is the educational philosophy behind the UWGB academic plan. In essence, it begins with people—especially students—and the world in which they live. Such an approach leads to a highly interrelated program, one that can be advantageously carried out by theme colleges in a multi-campus environment in the Northern Great Lakes region.

Most broadly, the academic plan assumes the importance of student commitment and involvement—commitment to and involvement in the world about which they seek to learn, commitment that leads to a concern for society and its constructive improvement. The preservation, use, and betterment of natural resources: the development of man's urban environment; new opportunities for self-expression in an ever more complicated world—these are a few of the concerns to which the committed student may devote himself.

In the belief that learning with a purpose is almost always more rapid than learning in the abstract—more rewarding as well—the UWGB instructional program helps students relate values, purposes, and learning. UWGB believes that man's problems should be observed firsthand and experienced, not just studied through books or in the classroom, laboratory, or studio. Close interaction between the student and the community is provided through off-campus experiences for credit, which qualified students are encouraged to elect. Various volunteer off-campus opportunities also are available.

Through such means, students at UWGB become full participants in their education with great freedom to adapt their programs and patterns of study to their needs. Their unique educational experiences inside and outside the classroom enrich other students and the professors as well.

A FOCUS ON ECOLOGY

From this philosophy and these convictions has grown the special focus of the UWGB academic plan: a focus on ecology, or the study of man in relation to his surroundings. Such an approach to knowledge becomes urgent in the face of the increasing complexity of unsolved problem of the physical and social environment.

The situations comprising our environmental crises are headlined daily: problems of urbanization, racial crisis, population explosion, the cold—and hot—wars, crisis of transportation, effects of automation, crisis of environmental pollution, failing supplies of food and water, and he rapid depletion of fossil fuels.

These problems have been compounded by feedback from attempts to solve one or another of them unilaterally. For example, just when biological productivity must be enhanced, biocides threaten to disrupt the biosphere. Just when plans mature to modify weather processes, it is discovered that air pollution has already set in motion widespread inadvertent weather modification, the consequences of which can now be only dimly perceived.

Because these crises stem from man's relation to and use of his environment, from interactions among men, and from man's perception of his place in the biosphere, they are all aspects really of the ecological crisis. Solutions must be found through the effective cooperation of society's major agencies including the university. The university, in fact, has leadership responsibility in this effort.

The UW mission

By assuming its share of leadership, with its focus on ecology, The University of Wisconsin-Green Bay is being faithful to the traditional mission of The University of Wisconsin. This mission calls for the development of teaching, research, and community outreach activities. At UWGB these activities are closely interwoven, forging combined programs designed to help solve our ecological or environmental problems.

An ecological focus demands an interdisciplinary—indeed, a pan-disciplinary—focus. Artificial boundaries of disciplines restrict rather than enhance understanding of the several evvironments of man. The study of any type of environment intersects many disciplines and involves all branches of knowledge—the physical, biological, and behavioral sciences and the humanities. Ecology is a focus that is broadening and liberating in its educational thrust, not specializing or restrictive.

A focus on ecology demands close collaboration between a university and its region. UWGB is ideally situated in this regard. Many persons and agencies in Northeastern Wisconsin were involved in planning the institution and are continuing to participate in its development. Among other things, members of the community have helped select many of the ecological problems on which the university is concentrating.

The collaboration between UWGB and its region is comparative in spirit rather than narrowing or parochial. Comparisons between environmental problems of the Northern Great Lakes region and world ecological crises are an integal part of the educational plan.

THEME COLLEGE ORGANIZATION

Because ecological inquiry is pan-disciplinary, UWGB has organized its colleges within the framework of environmental themes rather than grouping them according to traditional disciplines. Two colleges select certain types of environment for attention. The College of Environmental Sciences emphasizes the problems of the natural environment. The College of Community Sciences focuses on the social environment. The remaining two colleges are concerned with the individual within his environments. The College of Human Biology centers its attention on human adaptability—that is, on the impingement of environment on the individual. The College of Creative Communication emphasizes the problem of human identity, or the individual's impingement on his environment.

Each college incorporates selected aspects of the liberal arts disciplines with certain applied or professional emphases. Each theme college has responsibility for a coordinated program of undergraduate and graduate studies, research, and community outreach progams related to its special environmental concern. Each college is responsible for developing its own course structure at all levels. Interdisciplinary courses are numerous, and interdisciplinary concentrations are required.

Plan for general education

The UWGB student will find his undergraduate work a liberating experience. It is designed to liberate his spirit by development of his processes of thinking and by review and reinforcement if his values and sense of commitment.

At the core of the UWGB academic plan is a four-year series of liberal education seminars that begin with an introduction to values and environment, and culminate in the senior year in an all-university course that seeks to integrate knowledge from many fields.

During the intermediate two years, each theme college offers distinctive general or liberal education seminars grouped around some aspect of the environmental focus of the college. The purpose is to introduce the student to the knowledge of many disciplines as they relate to man's environment.

Individualization of learning is an important concept in the UWGB academic plan. All-University requirements are minimal, allowing the student great flexibility in designing his own program of study. In addition to the required four-year sequence of liberal education seminars, the student must satisfy two further requirements designed to (1) broaden his intellectual interests by providing him with a basic background in various environmental problems and disciplines and (2) make him familiar with different forms of communication and analysis.

To satisfy the first requirement—distribution—the student selects five or six hours of work in each of the theme colleges. Any course for which he is qualified may be selected, although certain courses are particularly appropriate. Courses in foreign language, data processing, mathematics, and studio experiences in the visual or performing arts meet the second requirement—tool subjects.

Either requirement can be satisfied by special examination that demonstrates the student's competence in the field. The student can take tool subjects that are not in his area of concentration on a pass-fail basis.

Plan for specialization

As the student begins to specialize, his interest in a particular discipline is related to certain environmental problems. The reciprocal is also true: his interest in certain environmental problems is related to particular disciplines. Thus a student primarily interested in chemistry can relate it to problems of the natural environment (College of Environmental Sciences) or to problems of the environment's impingement on the individual (College of Human Biology). Similarly, a student interested in air or water or soil pollution could relate his concern to physics, chemistry, biology, geology, or the social sciences.

A number of professional applications have been grouped together in the UWGB School of Professional Studies. They include business and public administration, teacher education, leisure sciences, mass communications, and social services.

Students selecting professional applications are expected to relate them to one or more of the problems emphasized within the theme colleges. Here again the philosophy of the University is knowledge put to use—for example, not just knowledge of administration, but knowledge of administration related to specific social or environmental problems.

Bold objectives

In sum, the University of Wisconsin-Green Bay is committed to an explicitly environmental approach to learning and knowledge. This applies not only to disciplines in the physical and biological sciences, where it is easy to comprehend and implement such an approach, but also to philosophy and literature, history and art—the so-called humanities. The environmental approach offers equally exciting opportunities in all areas of knowledge.

Through its coordinated program of teaching, research ,and community outreach, UWGB is committed to the realization of a number of bold objectives: meaningful and effective contributions to society by its members; the physical, mental, and social well-being of individuals; community development; a natural environment that permanently enhances life.

As the Coordinating Council for Higher Education put it in approving the UWGB academic plan in 1968: This program "takes the best of traditional approaches and imaginatively combines them with the newest ways men have developed to seek a better world through education."

EXHIBIT B.—SUMMARY OF ORGANIZATION AND UNDERGRADUATE PROGRAM, THE UNIVERSITY OF WISCONSIN-GREEN BAY

ACADEMIC ORGANIZATION

UWGB is headed by a Chancellor and its colleges and school are headed by deans. It is a single, multi-campus university with campuses at Green Bay (main campus), the Fox Valley, Manitowoc, and Marinette.

The academic plan of UWGB stresses the importance of a student's commitment to and involvement in the world with a concern for society and its constructive improvement. The academic program has as its special focus *ecology*—the relationship between man and his physical, biological, and social environment. Study of the Northern Great Lakes is especially stressed, along with comparisons to other areas or regions.

The college structure within UWGB is based on environmental themes and each theme college includes those faculty members and students interested in the respective thesis, regardless of their disciplinary affiliations. Thus, rather than college names which are composite identifications of a group of academic disciplines (e.g. Arts and Sciences), at UWGB college names reflect environmental themes:

1. *The College of Environmental Sciences.*—The foci here are problems and challenges in environmental control (i.e. man's attempt to change his resources or bio-physical environment) and analysis of ecosystems (i.e. man-environment interchange). Water, air, soil, and flora and fauna are of special concern.

2. *The College of Community Sciences.*—This college emphasizes the processes by which man relates to his social environment (community) and undertakes to makes it accommodate to his purposes. Approaches to an understanding of social environment are made through study of crucial regional and urban problems and the processes of modernization and change.

3. *The College of Human Biology.*—The central focus here is human adaptability. Human adjustment to the impingement of physical and social environments—our physical, mental, and social health and well-being—is stressed. Aspects of human adaptability given special attention are its theory, human growth and development, human performance, nutritional science, and population dynamics.

4. *The College of Creative Communication.*—Human identity is the central concern of his college. In a way it is a companion college to Human Biology. The latter focuses on the environment's impact on the individual. CCC focuses on the individual's impact on the environment. In order of find and assert his identity, an individual must perform the evaluative function of analysis-synthesis (creativity) and the outreach function of communication-action. The college's two concentrations parallel these functions.

Each theme college has the responsibility for teaching, research and public service programs relative to its special environmental concern. Each offers work in appropriate liberal arts and sciences disciplines as well as courses specifically tailored to its environmental focus. All disciplinary courses specially emphasize the subject's relevance to environmental problems. Interdisciplinary courses are frequent.

The School of Professional Studies

This School complements the theme colleges and is not analogous to them. It is responsible for professional programs that relate to all or nearly all the theme colleges. Undergraduate majors in business and public administration are available through SPS. However, even in this instance a theme college must be selected in which special work is undertaken in regard to man's environmental problems. Business and public administration are fields that can contribute much to the alleviation of such problems.

ACADEMIC PROGRAM (UNDERGRADUATE)

A. Three all-university requirements

1. *Liberal Education Seminars: All-University Requirement.*—The central core of liberal education at UWGB is a four-year series of Liberal Education Seminars, six credit hours each year, through which every student (a) as a freshman receives an introduction to values, ecology and environment, (b) as a sophomore focuses on a particular set of environmental problems with an off-campus, Northern Great Lakes regional experience, (c) as a junior studies previously selected problems in an "other culture" context outside the region, and (d) as a senior integrates what he has learned and experienced with a broad exposure to several academic disciplines and explores problems of values, belief, personal commitment and dedication. The sophomore year focuses on both the Northern Great Lakes dominate culture and selected sub-cultures such as American Indian, Black, and ethnic-American. The junior year focuses on selected Western and non-Western countries, including dominant and sub-cultures.

2. *Distribution Requirement: All-University Requirement.*—To encourage as much breadth as possible in undergraduate education, UWGB requires every student to select 5–6 hours of work in each of four theme colleges or to demonstrate presence of such breadth by special examination.

3. *Tool Subjects: All-University Requirement.*—To pursue knowledge effectively and to perform one's societal role adequately, the student must be familiar with different forms of communication and analysis. Tool subjects such as foreign language, data processing, mathematics, and studio experiences in the visual or performing arts meet this need. A student must satisfy the tool subject requirement on a pass-fail or special examination basis. A student must choose either a foreign language or a studio experience in the arts and, secondly, either mathematics (calculus) or data processing.

B. Three types of choices in regard to majors and minors

Choice 1: An Environmental Problem (The Concentration or Major).—A student must select an environmental problem (or concentration) on which to focus. A *concentration* requires 30 credits at the junior-senior level deflecting an interdisciplinary focus on an environmental problem.

Choice 2: A Discipline or Field of Knowledge (The Option or Co-Major).—A student may, in addition to his concentration, select an option. The term option refers to a discipline or field of knowledge such as art, political science, biology, or business and public administration. A student selecting a concentration-option combination will normally be required to take about 36 credits at the 300 and 400 levels, approximately 24 of which relate the option to the concentration (e.g. relate chemistry to environmental control with emphasis on water pollution, relate sociology to urban analysis, etc.).

Choice 3: Professional Application.—A student may choose to emphasize professional application of his concentration or option. He may do so in one of two ways: A collateral or a pre-professional program.

(a) Collaterals (or professional minors)

Each of the concentrations and options have direct professional applications (i.e. job relevance or relevance to a professional school experience). However, there are several special applications of the concentrations and options that require some additional particular competence. To meet this need, a student may select a *professional collateral* or minor in the School of Professional Studies which suppplements his liberal arts major and provides him with a professional-specialist orientation. Professional collateral courses are offered in education (leading to teacher certification at the early childhood (or preschool), elementary, and secondary levels), business administration, public administration, mass communications, recreation resource management, and social services. In most cases 18 hours are required for a professional collateral.

(b) Pre-Professional Programs

Three kinds of pre-professional opportunities are present. *First*, UWGB's regular majors and minors leading to a bachelor's degree offer appropriate preparation for most graduate professional schools such as law, medicine, dentistry, social work, music, and others. *Second*, for students desiring a four-year's bachelor's degree in engineering, nursing, or certain other applied fields, UWGB offers a special two-year pre-professional program. *Third*, students desiring both a liberal and a technical bachelor's degree can select a 3–2 plan leading to both a bachelor of arts (or science) at UWGB and a bachelor of nursing or engineering (or another applied field) at another institution. Three years are spent at UWGB, two at the other institution.

C. Electives and honors

Students can adapt their educational programs to their own intellectual objectives by electing courses from any college and opting for independent reading and study courses. In selected cases they may also propose their own distinctive programs or curricula if they and their advisors feel it a desirable course of action. Sophomores and juniors with a 3.5 grade point average and above may choose to become members of the Honors Program and be afforded special prerogatives.

D. New opportunities programs

A program designed for high school seniors who although very able do not meet normal entrance requirements affords special assistance through the sophomore year. A second program aims at older students who return to college after a lengthy break in attendance.

Remedial programs are available to students who evidence special need for remedial work (in English, foreign languages, mathematics, etc.) in the course of their collegiate careers. These programs are designed to reduce the attrition rate between the start and completion of collegiate work.

E. Undergraduate degrees

UWGB offers the following undergraduate degrees:

1. Bachelor of Arts or Science, Environmental Sciences
2. Bachelor of Arts or Science, Human Biology
3. Bachelor of Arts or Science, Community Sciences
4. Bachelor of Arts or Science, Creative Communication
5. Bachelor of Arts or Science, Administration

F. General information

UWGB operates on the following semester system: Fall semester September-December, Spring semester February–May, and a Special Studies Period each January. A minimum of 124 semester hours are required for graduation. Minimum full-time load=12 credit hours; maximum=18. Grade point averages on a 4.0 basis exclude courses taken on a pass-fail basis. One year of residence either at the junior or senior level is required for graduation. However, in order to graduate from UWGB a student must take at least half of the advanced work in his concentration or concentration-option in residence and take at least four semesters of the Liberal Education Seminar. Freshman or sophomore requirements are waived for transfer students who have met freshman or sophomore requirements at another institution.

G. List of majors and minors

Note: Most students will find their needs satisfied by the following broad choices. If any student does not, he may, in consultation with his faculty adviser, propose a special concentration, option, or professional program to the appropriate dean. However, only courses normally offered by UWGB may be used to fulfill the requirements of such special programs.

Choice 1: Concentrations or Majors.—

Unit of Administration:	Concentrations
College of Environmental Sciences	Environmental Control. Ecosystems Analysis.
College of Community Sciences	Regional Analysis. Urban Analysis. Modernization Processes.
College of Human Biology	Human Growth and Development. Nutritional Sciences. Population Dynamics. Human Performance. Human Adaptability.
College of Creative Communication	Analysis-Synthesis. Communication-Action.

Choice 2: Options or Co-Majors.—

Anthropology
Biology (biochemistry, microbiology, physiology, zoology, botany, entomology, ecology)
*Business Administration
Chemistry
Communication Sciences
Earth Sciences
Economics
Geography
History
Literature and Language (literature and creative use of language in English, French, German, and Spanish)
Mathematics
Performing Arts (music, drama, and dance)
Philosophy
Physics
Political Science
Psychology
*Public Administration
Sociology
Visual Arts

Choice 3: Professional Applications.—

Professional Collaterals (or professional minors):
  Education (leading to teacher certification at the early childhood (or preschool), elementary, and secondary levels)
  Business Administration
  Public Administration
  Mass Communications
  Recreation Resource Management
  Social Services

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*Students choosing these options or co-majors may elect to graduate with a bachelor of arts or science in administration.

Pre-Professional Programs:

(1) Examples of 4–0 programs[1]: law, medicine, dentistry, veterinary science, social work, journalism, education, music, drama, urban planning, business administration
(2) 2–2 programs[2]: engineering, nursing, agriculture
(3) 3–2 programs[3]: engineering, nursing, agriculture

EXHIBIT C.—UNIVERSITIES AND THE ENVIRONMENT: THE UWGB CASE—AMERICAN ASSOCIATION FOR HIGHER EDUCATION, CHICAGO, ILL.

(By Edward W. Weidner, Chancellor, University of Wisconsin-Green Bay)

The 1970's have been called the decade of the environment. This is the period of time when man is to become fully conscious of his responsibilities to the environment. He is to take the first major steps toward eliminating pollution of the environment. He is to launch massive new programs to put the environment to effective use, regulation, and preservation.

Increasingly, universities and colleges are being called upon to take dramatic action to help effectuate these changes. We read daily in the newspapers and in the newsletters associated with higher education that one college has adpoted a new course, another college has created an institute, perhaps a third institution has launched a research project, a fourth is emphasizing extension programs—all of which focus on problems of the environment, all of which are useful, but at the same time all of which are mere add-ons, and none of which basically changes the nature of the university or its social role. It is for this reason that many critics of American higher education claim that the establishment goes on while the urgent needs of society such as those associated with man and his environment are ignored. It is for this reason that American universities seem to lack credibility. It is for this reason that many institutions are far removed from students at the same time that they are far removed from the communities that surround them.

The University of Wisconsin-Green Bay is a new institution. It was three years in the planning: From 1966 until 1969. We occupied our new main campus and launched our new academic plan in the fall of 1969. Superficially, it may appear as if the University of Wisconsin-Green Bay is like any other institution. We train chemists, biologists, physicists, and mathematicians. We train business administration specialists, elementary and secondary school teachers, artists, musicians, and actors. A student may select a foreign language, English, philosophy, or history. And all of the social sciences can be found as well. There is much that is familiar at UWGB.

Our country and the world need persons who have majors in areas such as these. But our country and the world need citizens as well—citizens who are committed and dedicated to improving the lot of mankind on the planet earth. What good is a chemist if he does not relate his life and his specialty to the broader needs of mankind? What good is a sociologist if he does not see the broad world perspective? And surely the narrow specialists in the fine arts are stunted when they do not know the world.

The University of Wisconsin-Green Bay is one of the few institutions in the United States that has a focus for all of its activities. Our focus is man and his environment. It is our aim to make every part of our program related to our ecological crises. Whether it is teaching, research, or community outreach, the focus of the University remains consistently that of helping student, professor, and community member to relate more effectively to the environment, and to *do* something about the environment.

We term our institution a communiversity. A communiversity is a socially responsible university relating to a socially responsible community. It conceives of the universe of a university as being the living, breathing larger community of which it is a part.

Thus UWGB is based on two fundamental ideas, namely, a focus on man and his environment and acceptance of the concept of a communiversity. As a consequence, UWGB has forged an educational program that departs from traditional paths.

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[1] 4–0: A baccalaureate degree at UWGB preceding entry into a graduate professional school.

[2] 2–2: Two years at UWGB, two years at a professional school, with an undergraduate applied degree from that school.

[3] 3–2: Three years at UWGB, two years at a professional school with an undergraduate applied degree from that school and a liberal arts or science degree from UWGB.

First of all, there is a true reciprocal relationship between the University of Wisconsin-Green Bay and its surrounding community. University classrooms are not confined to the buildings on the campus. Students and professors study, observe, and work in the community. In turn, members of the community come into the classroom and interact with faculty and students. There can be no sharp division between town and gown in a communiversity. Teaching is related to problem-solving and decision-making in a context of relevance to ecological problems.

Secondly, teaching, research and community outreach meld into a single intellectual function. If one is studying pollution of a river, or the decay of a downtown urban area, the functions of teaching, research, and community outreach are one. Members of the community, students, and professors participate together in the entire process. No longer need a university be divided into three warring camps—those interested in undergraduate teaching, those interested in graduate work and research, and those interested in extension.

Thirdly, a focus on ecology and communiversity requires extensive and frequent contacts between faculty and students outside the classroom as well as inside. It means a joint search for solutions to some of man's most urgent problems, rather than a parroting of a second textbook in a lecture format, with the instructor disappearing once the class has come to an end.

Fourthly, UWGB's approach requires considerable student initiative in learning, as well as initiative by faculty members. If students are to play a major role in our environmental struggle in the decades ahead, they must learn to sort their values out clearly, identify the major problems, get adequate information to relate to the problems and carry out a program of cooperative action. This very process should be that which epitomizes the learning process at a university.

Fifthly, the UWGB philosophy requires that a university must be organized to devote itself to ecological problems, rather than be imbued with the sanctity of individual disciplines and professions. At UWGB disciplines and professions are secondary, ecological problems are primary. In faculty hiring and faculty organization, there is little concern with the field of a professor's Ph. D. There is much concern with the kinds of ecological problems on which he wishes to focus, along with students and members of the community. Both the primary mode of faculty organization and the primary contours of a student's program are determined along pan-disciplinary and ecological problem lines.

At the University of Wisconsin-Green Bay, a student selects an environmental problem that forms the center of his intellectual interests. It may be a problem of the bio-physical environment such as environmental control in regard to air, water, land, natural resources, or environmental engineering; it may be a problem associated with the social environment such as urban decay, regional planning, or the modernity process; it may be a focus on population dynamics, nutrition and the resource-population ratio, or the effect of environment on human development; and it may be an emphasis on human identity and its many diverse aspects as human beings are propelled into communication and action. If none of the formally stated ecological problems satisfy a student, he is invited to formulate his own environmental problem on which he wishes to concentrate.

The environmental problem then becomes the central point of relevance for a student's program. He chooses courses in the various disciplines and the various professions that contribute to thinking, problem-solving and decision-making in regard to the particular environmental problem. Thus chemistry, art, secondary school teaching, and psychology all of a sudden come alive. They are means to a social end. They relate one to another, as well as to the environmental problem. The world outside the university is just as relevant to a student's learning objectives as the world of books and classroom materials inside the university. Choices of off-campus experiences and on-campus community lecturers are consequently made with this test of relevance in mind.

If the contemporary university is truly to be a socially responsible institution to encourage or contribute to the socially responsible individual and community, it must do far more than add a few courses, a couple of research projects, an institute or two, or some extension programs. It must look to the very roots or nature of its philosophy and internal organization, and to its interface with the larger community. Only then can it help fulfill the promise that the decade of the 70's will be that period of time when true compatibility emerges between man and his environment.

EXHIBIT D.—SUMMARY DESCRIPTIONS OF THE FOUR THEME COLLEGES OF THE UNIVERSITY OF WISCONSIN-GREEN BAY AND OF THE CURRICULUM CONCENTRATIONS FOR WHICH EACH IS RESPONSIBLE

The College of Environmental Sciences is concerned with development of the concept of ecosystems. It seeks to establish an understanding of the exchange of materials and energy between living organisms and their physical and chemical environment, of the use and management of natural resources, and of alterations of ecosystems due to air, water, and soil pollution. The College administers the following concentrations:

1. The concentration in Environmental Control is concerned with the problems of pollution from human and industrial wastes; the conservation of resources such as fossil fuels, minerals, and wildlife; the conflict of interests arising from multiple use of resources.
2. The concentration in Ecosystem Analysis is concerned with study of the effects of man's interventions in the dynamics of the ecosystem. Students begin, of course, with a study of the dynamics themselves—the flows and transactions of energy and materials in the ecosystem.

The College of Human Biology has as its central concern the problem of human adaptability to environmental stresses—physical, chemical, biological and mental. It seeks to prepare students capable of investigating man within the framework of his total environment. The College administers the following concentrations:

1. The concentration in Human Development is concerned with both the physical and mental aspects of human growth and development, and the effect of environment on human development at different stages of life.
2. The concentration in Human Adaptability encompasses studies of man within the context of his total environment, with particular attention to the effects on man of environmental changes.
3. The concentration in Population Dynamics is concerned with the solution of problems stemming from the current tremendous growth rate of human populations.

The College of Community Sciences focuses upon the role of man in the social environment and the processes by which he modifies that environment. It administers the following concentrations:

1. The concentration in Regional Analysis examines the economic, political, and social interactions of people within the context of a geographic region. It places special emphasis on the Northern Great Lakes Region.
2. The concentration in Urban Analysis examines the economic, political, and social interactions of people within metropolitan areas.
3. The concentration in Modernization Processes is concerned with changes in the cultural environment in the direction of modernity. It examines those economic, political, and social factors that bring about changes in the essential values of the communities within which men live.

The College of Creative Communication is concerned with human identity and the cultural environment. It seeks particularly to established a coherence among the scientific, technological, social and artistic elements of that environment. The College administers the following concentrations:

1. The concentration in Analysis-Synthesis is concerned with the substance and formation of the value structure through which each person expresses his individuality.
2. The concentration in Communication-Action examines the processes by which human beings create reflections of themselves and others and by which they communicate with each other through these creations, and seek to modify their external environment.

Note: Few if any of the above concentrations are taught exclusively within the colleges which have administrative responsibility for them. Courses related to a given concentration are usually found in more than one college. All concentrations are pan-disciplinary. In addition to the four theme colleges, there is a School of Professional Studies which offers collateral programs both professional and pre-professional in nature, supplementing the concentrations in the theme colleges.

Mr. BRADEMAS. Thank you very much, Chancellor Weidner. At the outset, let me say that which will not astonish you, one of the reasons we were anxious to hear from you and your colleague, Chancellor

Vlasin, who, I understand, has not been able to arrive because of plane difficulties, but his testimony we shall be glad to insert in the record following yours as if read, but one of the reasons we were interested to hear from you is that the University of Wisconsin at Green Bay has already, in its short existence, established certain reputations for pioneering in this field, and we want to learn from you something of what you have found in seeking to establish a university on an environmental base, as it were.

One of the questions I would put to you is this: To what extent is your example being replicated across the country? Are you unique or are there similar efforts going on elsewhere?

Mr. WEIDNER. Mr. Chairman, I believe that we are unique in one sense. We are unique in the sense that we are a new institution which developed a concept of man and his environment for the entire institution. We are not unique in talking about man and his environment, but it is much easier in an established institution to add on, to add on a few courses, or to add on a particular experimental college, as some institutions have done. It is difficult at an established institution to change the entire curriculum.

If I might expand upon your question, general education is a kind of education which is thought desirable for all undergraduate students, no matter what their discipline and no matter what their profession, and general education traditionally in this country has been devoted to certain kinds of things, written and spoken English being a very good example, American studies, and very much in the 1950's and 1960's, I think very much with encouragement of men such as you, Mr. Chairman, international education became an element in general education.

But I know of no institution which has developed a theme of man and his environment in its general education package other than our own institution. There probably are some but I don't know of any, and it is not very common.

There is another element to this, however, if you put it into a general education package along with international education and written and spoken English and so on; there is still a traditional possibility of relating it within each of the majors with an institution.

For example, if a student is majoring in secondary or elementary education, isn't it reasonable, isn't it urgent that that student understand something about man and his environment as applied to secondary or elementary education? Isn't it urgent that that individual know the kind of projects that he or she might carry out within a public or private school context?

If a person is going to be an engineer, isn't it important that he understand the role of engineering in regard to environment? If a person is going to be a lawyer, chemist, artist, or whatever, I think it is equally important that each of these disciplines, fields of study or professions apply themselves to problems of the environment, give students inspiration, give students practice in this kind of application.

I think it is important for the future of our country and the world: I think it is also a good education theory because it immediately gives the student motivation.

I have wandered, in response to your question, but to come back to the gist of it, Mr. Chairman, let me say there are a number of institutions which have added courses, which have added institutes, there are a few of the experimental colleges that are focusing upon this, but there are all too few, almost no institutions that have applied this systematically to their general education and then taken a step further to apply it to each of the disciplines or fields or professions.

Mr. **Brademas.** You express in your statement a certain degree of skepticism, as I read you, about the prospect for existing colleges and universities, structured as they are around the various academic disciplines, for being able to achieve the kind of multidisciplinary approach that you indicate is essential, and in this respect I take it that your view is on all fours with that expressed by Dr. Steinhart when he put together the report for the White House on this subject.

I believe I am correct in saying that it was his recommendation that American colleges and universities should establish within themselves new faculties or new schools of environmental studies which would indeed be interdisciplinary.

Now, those observations are by way of preface to my question, which is: Given the real world as it is, it is rather difficult, if we are to make substantial advance rapidly in this area, for us to multiply University of Wisconsin at Green Bays all over the country, therefore does it not make more sense that we get going along the lines of the recommendations of the report of Dr. Steinhart that you establish in existing universities some such interdisciplinary problem oriented faculties of environmental studies?

Mr. **Weidner.** It makes a lot of sense. I suppose that educators, like politicians, have pragmatic elements in their being. Obviously, we must adjust our goals to the situations that we face. I would only say that I think it is a matter of priority; I would hope that this committee, through its consideration of this bill, would try to give priority in funding to encourage institutions to integrate this kind of thing in their general education pattern and for that matter in their pattern of discipline and professional educational.

But I don't think that should be the exclusive priority. I am very pleased to comment upon your question, because I would not want to be misunderstood in regard to that. When we get institutions of 30,000 and 40,000, and we have a number of them in this country, a number of them with that number of students, it is quite obvious that a special school or institute can attract thousands of students within that particular campus and it would be important to encourage this kind of thing, so long as this particular school or college within a larger university has an important general undergraduate mission rather than just training specialists.

I am not sure we need to emphasize the training of specialists. We are doing a pretty good job in that area, it would be my opinion. But, if I were to comment upon our sister institution in Madison, University of Wisconsin at Madison, it has recently established an institute on environmental studies at the undergraduate level, and it is possible that there may be as many as several students that take courses in that institute as an option to add to their undergraduate education.

I think this kind of thing is desirable. But I think priorities, the prime carrot, ought to be across the board, universitywide.

Mr. **Brademas.** Let me ask you just a couple of questions because my colleagues will want to ask questions. The bill under consideration today does not provide for the development of curriculum materials for teaching, chiefly at the elementary and secondary school levels and in community conferences, and I wonder, therefore, if you could comment on two aspects of your testimony:

One, how do you see the capacity of American higher education at this point in time to produce the kind of teaching materials for use in our elementary and secondary schools and in community conferences of a kind that are contemplated by the bill?

Mr. WEIDNER. If I had my colleague Dr. Vlasin here, I am sure he would have liked to have commented, and I probably have avoided commenting on it because I anticipated he would be with us to do so.

Let me say, first of all, as a philosophical bias, that many of the things I am saying assume that the university is doing the kinds of things that you have just outlined. We have a term that we have been using, and the term is "communiversity." I suppose the definition might be "a socially concerned university interacting on a reciprocal basis with a social-conscious community outside of the university."

Truly, if one focuses on environmental problems in the manner that we have done, one can never tell when he is engaging in community outreach activities and when engaging in undergraduate instruction, when he is not helping secondary and elementary schools and when he is carrying out research, applied research, and undergraduate instruction. We meld the two together. I say this as a preface, as an explanation perhaps of some of the things I have been saying.

Relative to curricular materials for elementary and secondary schools, we would simply say that it is our feeling that these are very inadequate at the present time. We have started placing some of our young people in practice teaching situations. We had hoped they would be able to experiment somewhat with an environmental focus during their practice teaching. This has proved to be very difficult because of lack of materials and the tremendous amount of time, energy, and money that it takes to produce them systematically and to evaluate their usefulness. It is not always useful even though such materials look appealing to adults, because they sometimes don't have effect on the young people.

Similarly, in terms of community outreach activities, it is very difficult to carry out anything on a concentrated fashion because of lack of materials, once again. I think of some of our work in the foreign policy area, where we have had many, many years of experience of integrated materials that would lead adults into discussion groups for some weeks or even months and serve as an educational base, where we have material for institutes and conferences in quite a total, and I think this is not true in the environmental area.

Of course, anyone can hold a quicky conference or seminar at the present time, but we do lack systematic educational devices, and I am speaking of a noncredit variety, to work with the community, and we lack the materials to work into the elementary and secondary school level as well.

We have had some experiences working with school districts in our region, the Green Bay, Appleton, Manitowoc school systems—or example, Neenah, Menasha—and our school systems have been quite interested in working with us. Some of their school board members and superintendents or administrators are on advisory committees of

UWGB. We have over 300 citizens on such advisory committees, incidentally. Some of these committees focus on elementary and secondary education.

It is the opinion of these advisory committees that we have a great paucity of information. The opinion of our overall community advisory committee is, we need materials for community outreach or adult education.

Mr. **Brademas.** This is my last question: Is there not in this country some kind of environmental education association which has as its principal purpose the encouragement of the kinds of activities contemplated in this bill, including development of teaching materials for use in elementary and secondary schools?

Mr. **Weidner.** There are several organizations devoted to improving man's environment. I think, however, that no one organization predominates, no one organization has been in this field long enough to provide the kinds of services that I was referring to or I think the services you were referring to.

These organizations go all the way from the Izaak Walton League to the Audubon Society and a variety of others. I think it is important to work with these groups and perhaps one of the objects of this bill might be to foster cooperation between colleges and universities and organizations such as these.

One of the difficulties, though, of working with organizations such as these is that some of them, and I wouldn't want to identify any particular one, but some of them are devoted primarily to pointing out the rascals, and those of us in education have to have something beyond that.

Mr. **Brademas.** Thank you very much. Mr. Steiger.

Mr. **Steiger.** Thank you, Mr. Chairman. Dr. Weidner, your statement and philosophy, I think, is helpful to the committee. I must say that one of the things that concerns me, and for which I have no answer except by way of what kind of guidance you have given us, is the whole question of what we do each year when some new subject area of concern to the people in this country arises. One year it is engineers because of Sputnik and then it is physicists, and this year it may be colleges and the environment. All of that is well and it is good to focus on it, but I am not yet convinced that a single-purpose institute is really what needs to be done.

In your statement in Chicago, you made the point, and you made it again here today, about the UWGB philosophy requiring that the university be organized to devote itself to environmental problems rather than being imbued with sanctity of individual views and professions.

That being the case and in terms of the kind of community outreach concept that you have at the University of Wisconsin at Green Bay—that is to say that teaching, research, outreach all meld together—have you any kinds of specific suggestions that you could make now, or would you be willing to submit later, that the committee might use in trying to develop this kind of approach or give some seed money to institutions of higher education that might be willing to get into this kind of concept? Or should we do it?

Mr. **Weidner.** I will answer that in two parts, if I might. First of all, I think it is very important to take a broad view of undergraduate education and its purpose. There is much in literature that suggests undergraduate education is primarily designed to stimulate people, stimulate students in their thinking processes. There is much in the literature about undergraduate education that suggests that developing skills and problem solving is an objective, and those are probably two ways of saying much the same thing, and I do feel, myself, that what the students today are demanding when they talk about relevance is primarily that they are interested in problem solving, and application or examples of application and particular examples that one uses during the life of an undergraduate are not probably so important as the fact that one uses examples and one does focus on problem solving, and if one focuses on problem solving, one also gets disciplinary or interdisciplinary considerations.

All of a sudden a person who is a majoring in chemistry understands if he is going to make a contribution after leaving, let alone when at the university, he has to learn to work with biologists and physicists and engineers and economists and political scientists and sociologists and teachers and lawyers and so on, and this is one of the great discoveries about problem solving, about cooperative action, and it is this kind of process we are interested in. It is this philosophy that undergirds our approach, and this is why we feel fundamentally that this not a fad.

I know some people have said, "Well, look, now, there is a bill in Congress that would add environment to the concerns of education," and, you know, we had a variety of other things in the past—international education and other kinds of things that came along—and I would just say if we are going to take a problem-solving approach and if this is an objective of undergraduate education, the urgent problems that are right on every university's doorstep are environmental.

I don't use that term just in a biophysical sense. If we use it in that sense alone, we restrict our compass greatly.

Now let me add to that another element. Secondly, I would say, yes, I think there are specific things that can be encouraged, and encouraged from this problem-solving point of view, and I would suggest that one of the exhibits here, perhaps the last one, is an example, where we have submitted a brief definitional outline of some of the environmental problem areas that we have students focus upon.

Now, remember, our students become teachers and business administration specialists and chemists and political scientists just like other students, but what we seek to do is to focus their problem orientation on examples of environmental problems.

I would think that Congress, through a bill such as this, might want to take such problems as human development and the different ways in which different kinds of environment affect human development. For example, it is said, and this is not my field, but it is said that if a child suffers from malnutrition the first few months of his life, this considerably reduces his intelligence for the rest of his life.

The nutritional components of development at different periods of life, straight on through the golden years, would be an important environmental problem. What kind of society do we want in the future and so on; how are these things going to be achieved for maximum human development? That is a widespread or very broad kind of environmental problem.

Take the population explosion, something we call population dynamics; there is another example of an environmental problem which is not going to be solved tomorrow but which, again, relates all of the disciplines in all of the professions and gives faculty member, community member, and student an opportunity to work together during the undergraduate years.

We have had undergraduates work with a clinic at Green Bay, for example, studying the effects of the pill on women. This is a combination of community outreach, research, and undergraduate education rolled into one, and these are not people that are going to specialize in medicine or even in biology. It is very suggestive of the kind of thing that can be done. Or we can emphasize the effect of the modernity process on our own society as well as on less-developed countries.

If we are going to develop our technology in the manner we have done, what does this have to do with the kind of environment, the kind of satisfactions we are going to find, and again in all of this, all professions are related and again you can join hands with the community. The community members are just as expert in this area as are we.

I would think that we could develop a series of subject matter projects here.

Mr. Steiger. Let me ask one more question. As I recall the State law in Wisconsin, there is a requirement that conservation, which I think is the word used, should be taught at least, or be included within the curriculum or taught for a specified period of time in high schools of Wisconsin. I wonder whether or not, although you may not necessarily have taken a look at that question—whether or not that makes any sense to you, to try to require something such as we do in our State and, I think, in most States, such as physical education for a certain amount of time, history of the State for a certain amount of time, conservation for a certain amount of time, and can we either use that pattern and say this is a method to be used to get to the goal, or can you find a way to break that pattern if it is not effective?

Mr. Weidner. My own feeling is that it is probably unwise to try to legislate curricula. I don't think that the Wisconsin example would encourage this particularly. You recall that Wisconsin law is, of course, very accurate; it is in high school, it is an optional course, not a required course, but it is required that it be in the high school and the students to take it.

It means also that if an institution of higher education is going to certify teachers, they have to offer such a course.

Mr. Steiger. Not just offered; isn't it required of elementary and secondary schoolteachers?

Mr. Weidner. Yes, but not required of elementary or secondary students or pupils, correct.

Mr. Steiger. Yes. So the teacher has to get it in his curriculum.

Mr. Weidner. That is correct. We have been working with the Department of Public Instruction in regard to this course to explore the possibilities of opening it up and broadening it a little bit. Traditionally, it has been a natural resources kind of conservation, and the Department has been very interested in seeing what can be done in broadening it: but to get to the heart of your question, it seems to me that adding required components is not too effective, because what one gets is an isolated cluster here, an isolated cluster there, an isolated cluster over there, and nothing seems to meld together, and it is the melding together with which I am principally concerned and which it seems to me this committee might well consider as its principal concern.

What we want to do is make a people excited about this, concerned about this, realizing that in their lives what they are interested in has something to do with environment, and I don't think we do this through a required course just kind of tacked on. One of the ways we have done it at the University of Wisconsin at Green Bay that could actually be copied in elementary and secondary schools, although I am not formally proposing it, is to abolish the freshman composition course and substitute in its place a general education course such as we have in the freshman seminar which gives the student about the equivalent in writing experience, but it is a writing experience on problems of environment, so that at the same time they are learning how to communicate more effectively in writing and in speech for that matter, they are learning about the crisis, the ecological crisis, and how different fields of study are related to it.

We come back with a similar course in the senior year. By that time all of them have gone through specialized courses. At the senior level, we say, "All right, you majored in X, Y, and Z, and how is it related to problems of environment, particularly focusing on problems of cooperative action, cooperative problem-solving. It is something that could be easily done in high schools. We are not adding anything to the curriculum. We are using an objective within the curriculum and focusing on environmental problems and perhaps making it more exciting, and enhancing motivation.

Mr. Steiger. Thank you, Mr. Chairman. I just want to compliment the chancellor for what he has done and the way he has gone about it. We are very proud of him in Wisconsin and proud to have him here today.

Mr. Brademas. Mr. Hansen.

Mr. Hansen. Thank you, Mr. Chairman. I will join with my colleagues in extending to you a warm welcome and our collective appreciation for your assistance. Obviously you and the University of Wisconsin at Green Bay have done some very effective pioneering work.

I might say one of the things about your statement that impressed me the most is that it conveys a sense of urgency without creating panic. It seems to me that while recognizing a crisis, it is essentially that we avoid some of the panic and hysteria that we could be led into by some who are calling attention to the very real danger to the environment.

I am hopeful that the experience at the University of Wisconsin at Green Bay which you are advancing as a model, as an example of what every institution should follow, I am wondering if you can see in this bill a tool that might provide the kind of stimulus to other universities to following this type of program at the University of Wisconsin at Green Bay.

Mr. Weidner. I think it can be. It all depends on how a bill is interpreted and applied, of course. One of the things to be avoided in any grant situation is to put a carrot before some institution, to do something for 2 or 3 years, and then when the money runs out, the institution reverts to its previous character and it has just been a spot kind of effect.

I would hope in the administering of this particular bill, should it become law, perhaps written into some of its criteria there would be an emphasis on granting money to institutions who wanted to continue doing something in this area with their own resources after the particular startup money has been expended.

This is not a very expensive area, because or at least the way I see it, after the startup costs are made. If we had appropriate teaching materials at elementary, secondary, and higher education levels, and at community outreach and continuing educational levels, I think higher education could administer programs without any further Federal support. I see no reason for further Federal support. I think startup costs, such as teaching materials, should be emphasized the most; perhaps startup costs in connection with experimental programs relating the universities to elementary and secondary education and the university to the community.

I agree very much that it would be wrong to go into this area on a panic basis, and I don't think that education is an institution which functions well in a panic psychology.

You remember I said in commenting about some private associations in this field that they tended just to point to the exploiters and that that was not sufficient for higher education. I give one example. We come from a paper industry area, and there are many examples of water pollution and air pollution stemming from that paper industry, and it is very easy to point the finger of scorn to the paper industry or at the paper industry. Similarly it is very easy to point the finger of scorn at various municipalities in our region who have not treated their sewage appropriately.

We had the experience last fall of having some students develop projects. We feel that one of the essential elements here, if you are going to get into problem solving, is to put the initiative of learning in identifying projects on students, have them take the initiative.

In this full semester group, the students decide to investigate water pollution on the part of the paper industry, and their discussion before they found anything about it was very scornful, very, very critical, just terrible, and they were going to really find out that the paper industry was polluting the river and was not doing much about it.

They divided into four teams and went to four different paper companies. It is unfortunate but true that three of the four teams got turned away, primarily probably because they had not checked very well as to who to approach. We have not been at this long enough to have all of our lines jell perfectly. But the fourth team got to the right person and they spent several days, full days, at this particular paper plant, and they learned that this particular paper company had spent millions of dollars in research; they watched the research going on, analyzed the results, got copies of the results, brought it back to the class and made quite a report that really changed the entire outlook of that entire seminar.

I think we have to stress cooperative action, and it is my own feeling that while on occasion it is true that confrontation may be a necessary vehicle to force social action, that as a day-to-day strategy, it is lacking, and that we have to stress cooperative action of getting people involved and recognizing the complexities of the situation.

That is what we are trying to do; thus we try not to separate research, teaching, and extension, we try not to separate professor and student, but everybody is trying to explore solutions to problems and explore how different fields and endeavors can contribute cooperatively to community action.

Mr. **Hansen**. Let me call attention to another part of your testimony. It seems to me this deserves to be emphasized, particularly in view of some of the earlier suggestions we have had that there is a hard body of knowledge that we have to learn before we can move effectively on programs designed to enhance quality of the environment.

In your testimony you pointed out, I think quite correctly, we are not discovering new truths, except perhaps in a technological sense, but we are discovering, with some urgency, the application of old truths.

I also glanced over testimony that your colleague Dr. Vlasin would have presented had the airlines been more accommodating. He spoke of a monumental environmental education gap. I assume both of you are saying, in effect, that we know a great deal. Much of it is not very complicated, but the urgent need is to gain understanding of the environment, of the body of knowledge that is available and to apply it.

Mr. **Weidner**. Yes, we are saying that very much. I cite a couple of examples. It is not very complicated to understand that a combined storm and sanitary sewer system raises pollution problems, and it is not very complicated, from a technical point of view, to figure out how an individual can take his roof drains and sump pumps and connect them to the storm sewer rather than sanitary sewer, and the cost is pretty predictable also, and I realize in some cities they have no separation at all and they have quite a different problem.

But take the city of Green Bay; it is about 97 percent separate in terms of sanitary and storm sewers. The sewers are there, and when individuals connect, will they see the importance of it? It is a very simple problem of motivation and awareness, commitment and concern. It does, I think, force a humility on undergraduates and professors as well to take a look at a problem like this and very quickly everyone starts to realize that everyone is a polluter.

I think college students are becoming very aware of this, although sometimes they have not applied the antipollution movement to their rooms or their cafeterias: but, seriously, they are starting to emphasize the bicycle, they are starting to argue you shouldn't go just one person in a car and so on.

These may not be the right solutions but point up the underlying fact that we are beginning to realize that everyone is a polluter, that everyone needs to join in doing something about this, and I think this is a good step toward wisdom as well as problem solution.

Mr. **Hansen**. Thank you very much. We are most grateful for your testimony.

Mr. **Brademas**. Thank you very much indeed, Chancellor Weidner. I hope you will express our appreciation as well to your colleague Mr. Vlasin and our regrets he was not able to be with us. I have read and I am sure my colleagues have his excellent statement, and it will be incorporated in the record.

Mr. Weidner. I am sure I speak for him in thanking you and the committee for the courtesy of giving us time to express some views on this important subject, and if we can in any way help you in your further deliberations we stand ready to do so.

Mr. Brademas. Thank you.

(The statement referred to follows:)

Statement of Dr. Raymond D. Vlasin, Assistant Chancellor for Community Outreach and Research, University of Wisconsin-Green Bay; and Assistant Chancellor for Extension, University Extension, University of Wisconsin

Mr. Chairman, there is today a monumental environmental education gap. It is the gap between scientists' knowledge and citizens' understanding of environmental problems and of possible solutions to those problems. This gap must be closed if we are to survive.

If passed and adequately funded, "The Environmental Quality Education Act" could serve as a major tool for closing the environmental education gap. It is for this reason that I am delighted to testify on H.R. 14753, sharing with you some observations and suggestions.

As Dr. Weidner has pointed out, our environmental crises are not brought on primarily by lack of scientific and technological knowledge. The crises are rooted instead in the attitudes and values of all of us. In work at The University of Wisconsin-Green Bay and in University Extension, the extension arm of The University of Wisconsin, we have found that the combined adverse actions of individuals, families, businesses, industry, governmental units and communities throughout the nation have caused major environmental problems. The problems occur in both our natural resource environment and our man-made environment.

In the natural resource environment we see fouled streams ad rivers, deteriorating lakes, polluted air, defaced landscapes. We also see cut up and squandered open spaces, cluttered and defaced parks and wilderness areas, destroyed scenic vistas and other natural resource abuses.

In the man-made environment we see crowded, noisy and deteriorating urban places as well as unhealthy dust, air pollutants, and smog. We also see ugliness of poles, lines and wires crisscrossing the sky, and garish or inappropriately placed structures, billboards and facilities. One can include also examples of dreary internal surroundings such as may be present where people work, where youth and adult learn and are cared for, and where the elderly live out their existence.

In UWGB, and in University Extension, we are convinced that we and others must look at the broad array of environmental problems and work vigorously for their solution. In UWGB, we have organized our educational efforts around environmental problem areas.[1] In addition, we have integrated instruction, research and community outreach efforts behind these problem areas. Such integrated efforts are designed to involve UWGB faculty and students with community leaders in educational thrusts on-campus and off-campus on environmental problems and their possible solution. This action is in cooperation with University Extension which has increased its emphasis in this problem area. One of its divisions is focusing on economic and environmental development.

As we proceed, some environmental education needs are becoming clearer to us. I will describe some of those education needs, and as appropriate, reflect on some of our social values and attitudes behind those needs.

First, it is a fact that individuals, families, businesses, industries, governmental units and communities have not fully recognized the environmental consequences of their acts. In particular, these units have generally ignored the social costs or hardships imposed on others by either their productive or consumptive acts or both. Examples of this problem are very numerous.

One key example of social costs imposed on others is the increased cost or decreased usefulness of water to a downstream user because of actions by an upstream user. Another is the higher cost of home maintenance, diminished home enjoyment, and increased health problems by downwind recipients of airborne pollutants. Still other examples are the limitations imposed on all by one or a few that deface landscapes, cut up and squander open spaces, destroy forested and green areas, adversely alter parks and wilderness areas, destroy scenic vistas, and make other assaults on our natural resource and our man-made environments. Helping adults and youth in all walks of life understanding the consequences of their individual acts on others is one of our greatest environmental education needs and challenges.

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[1] Testimony by Dr. Edward W. Weidner before the Select Subcommittee on Education, Committee on Education and Labor, U.S. House of Representatives, March 26, 1970. See also Exhibits A, B, C and D of that testimony.

Second, environmental problems seldon occur in isolation. They frequently involve a range of other activities of man including interrelations with other parts of his environment. These conditions alone would make the problems difficult to understand and remedy. In addition, a particular environmental problem might involve investments of capital, some group's economic well-being, job opportunities, and taxes. The problem also might involve laws, customs and habits that permit and in some instances even encourage, the problem. Further, those who receive the benefits from existing arrangements may not be the same persons who bear the social costs. Thus, there is little wonder that both confusion and frustration occur as people recommend simple solutions to complex problems that cannot be solved in that manner. Helping people understand the relatedness of environmental problems is another urgent educational need.

Third, most of the crushing environmental problems involve sizable groups of persons. The remedial actions for such problems in turn usually require group or public action. The group action may be in evaluating and planning for the environmental improvement, in promoting the improvement, and in financing the improvement. Group effort may be involved in coordinating community and governmental action, in improving the laws or other institutional arrangements, and in maintaining, supporting and servicing the environmental improvement once it has been achieved. Educating adults and youth about group problems and about individual and group responsibilities is still another badly needed part of environmental education.

Fourth, the remedial actions on environmental problems must be broadly feasible. For example, to succeed the remedy for a natural resource environmental problem may need to be physically (including chemically and biologically) and engineeringly possible. But to succeed it also may need to be feasible or optimal in an economic sense, acceptable politically and legally, and possibly administratively. Consequently, both interdisciplinary analyses and interdisciplinary educational efforts with the public are prerequisites of major environmental improvements.

Fifth, there is much confusion over environmental quality levels. We must determine those quality levels of environment we need in order to survive and launch an educational effort about them. Presumably those survival levels must be met at all costs. Beyond the minimum quality levels for survival, we must determine what additional quality levels we hope to achieve and maintain. These decision concerning environmental quality must be translated into quality levels for air, water, land and other features of our natural-resource environment and for our man-made environment. The educational requirement here is both large and urgent.

Sixth, it is clear that the market forces in our private enterprise economy can be made to cope with more of the societal costs of pollutant creating activities. One need only reflect upon the array of solid wastes that clutter our landscape to become acutely aware of the need for greater responsiveness to social costs by the market mechanisms. The possible supplements to the private market forces include (1) appeals to civic responsibility; (2) regulatory and enforcement actions by public agencies; (3) adversary proceedings in courts by damaged parties or by concerned citizen groups; (4) financial inducements; and (5) financial charges for pollutants discharged. These and other possible supplements for improving the market mechanism are poorly understood and decision makers could benefit greatly from an increased understanding of them. Again, education is required.

Seventh, it is clear that we have been less than successful in integrating decisions about "economic development" and decisions about "environmental quality improvement." Historically, we have treated these groups of decisions separately. At the local community levels we observed separate pathways by conservation and service groups concerned with the environmental quality and by community, business, and industrial groups concerned with economic development. We see also a separation at state levels between groups handling business and industrial development, and groups concerned with environmental quality improvement. These separations appear at the national level as well. Even though we are making some progress at all levels we seem to be just beginning. I personally have seen many environmental abuses that have occurred in the process of community development, residential development, business development, recreational development, and industrial development. The irony is that some of these adverse impacts could have been largely or entirely eliminated by a more careful integration of environmental concerns and developmental concerns. Again, education of decision makers and the public is a key.

Eighth, environmental problems do not respect community and political boundaries. Therefore, to handle the problems those affected may need to create new management systems and organizational and governmental arrangements or to improve the existing ones. The alternative choices include various public, various private and various public-private management systems and organizational arrangements. They might cover a multi-community, multi-county or multi-state area. Clearly, there is need for education about such systems and arrangements. Likewise, we must educate the public about environmental problems such as pollution of our international water and impart knowledge about it. And, of course, the assault of our exploding population on the natural resource environment and the man-made environment constitutes one of the most pressing national and international problems for education and remedial action.

Ninth, there is need also for educational efforts directly upon some of our social values and preferences. There is a deep attachment by many people to more production and more consumption as if they were an "absolute good." One need only reflect upon the way we have given growth of GNP such prominence, the way we treat increased volumes of products produced and sold as an "unquestioned good", and the way we look at increased electrical power and other utility use as a "mark of progress." At the family and consumer level there is a deep attachment to more garbage disposals, more electrical appliances, more cars, more travel, and more of other conveniences, all of which give us increased resource demands. I observe that youth, individual adults, and families normally do not see much connection between their preference for more of these things and an impact upon the environment.

There are other values that also need to be highlighted. We seem to have arrived at a point in time when it is antisocial for large businesses, industries and utilities to pollute our natural environment, particularly air and water. However, we seem to view our local municipalities as being less antisocial if they pollute the air or water. By further contrast, we seem to attach little or no antisocial label to individuals or families who by their actions pollute the environment. Without a feeling of social stigma, individuals and members of families drive to and from work each day alone, discard litter with ease, show little concern about side effects of their consumption and recreation habits, and take other actions that make increased demands on goods and services with associated social costs.

Mister Chairman, it is absolutely essential that as a nation we launch a major hard hitting environmental education program with all adults, as well as with the teachers and youth in our elementary and secondary schools. For example, we must help those in business, industry, commerce, and labor see the environmental consequences of their production, processing, manufacturing, transportation and disposition. We must help local, regional and state governmental officials and employees, as well as community leaders and community and regional development personnel identify opportunities for economic progress with environmental quality preservation. We must help stockholders and other income recipients see the importance of environmental quality restoration and preservation as well as financial gain. We must help those who direct, build and maintain our utilities and the public that uses them, safeguard our natural resource and our man-made environment. We must help those who help pass and enforce our ordinances and laws have a clearer grasp of our environment and the preservation of an ecological balance. We must help them develop and integrate urban environmental preservation policies with land settlement policies, with urban and rural development, with policies for industrial location, and with tax preference policies.

I stress the adults of today because they are the ones who are responsible for the major productive and consumptive decisions today. They are adding to our population. They are the ones who have the responsibility for establishing and maintaining family attitudes consistent with environmental preservation and ecological balance.

The purposes of H.R. 14753 are both necessary and functional. I say that because they parallel in a remarkable way the education thrust of The University of Wisconsin-Green Bay which is itself relevant and functional.

Institutions of higher education can play a major role in helping to implement H.R. 14753. For example, among the activities at UWGB we propose are: (1) A national symposium on environmental education designed to focus on the educational aspects and curriculum, as well as staff needs; (2) Summer workshops in environmental science education designed to train teachers to become environmental change agents within school districts; (3) A program of liaison and staff development in the local school districts, utilizing individuals trained during the summer workshops; (4) Assessment and evaluation of each phase, with feedback being used to plan and develop the next step in establishing environmental literacy.

We have recently conducted major conferences on environmental quality, and on population. We propose other related conferences, seminars and workshops. For example, one series of workshops will be devoted to developing some environmental quality guidelines that can be used by community development and industrial development groups.

To further strengthen the H.R. 14753, I would stress strong programs and funding for educational efforts with adults. In my judgment, our greatest inadequacy in education today is in adult education, and the need for environmental education with adults ranks at the top among adult and societal needs.

Also, there is need for capital funds, whether in this Act or others, for the development of certain demonstration and education facilities at ecologically-oriented institutions. For example, at the University of Wisconsin-Green Bay, we are beginning to think in terms of a combined conference-demonstration center to support a continuing program of workshops, symposia, exhibits, pilot projects and even dramatic presentations that will all be related directly to the development of ecological awareness and the solution of specific environmental problems. We see such an environmental improvement center as being essential to the full accomplishment of our mission. Since it cannot be justified primarily, however, as a facility for the education of our undergraduate students—although they would certainly become involved in its activities—we are not likely to succeed in having it included in our state-financed construction program. This means that we must turn to business and industry, private donors and the federal government. Although we have not yet had time to prepare detailed plans for this facility, I feel confident that ample justification for a federal contribution can be developed.

Your bill as drafted does not appear to contemplate capital grants. You may wish to give consideration to specific authority for such grants to the extent that they are directly related to the educational and demonstration objectives of the bill.

I applaud the attention given by H.R. 14753 to technical assistance. I would urge that technical assistance under the Act should be viewed as a continuing commitment. It takes time to develop an effective and smoothly functioning, technical assistance effort. Further, I urge that the technical assistance by the Secretary and Cabinet officers not be conducted separately from the centrally related issues and programs concerning rural development, urban settlement, economic development and industrial dispersion, and the investment and tax policies facilitating these.

Mister Chairman, I thank you for the opportunity to share my observations with you and I will be pleased to assist you and your Committee in any way I can.

STATEMENT OF CLAY SCHOENFELD, CHAIRMAN, CENTER FOR ENVIRONMENTAL COMMUNICATIONS AND EDUCATION STUDIES, UNIVERSITY OF WISCONSIN, MADISON; EDITOR, JOURNAL OF ENVIRONMENTAL EDUCATION

Mr. BRADEMAS. Our next witness this morning is also from the State of Wisconsin and would you like to introduce him, Mr. Steiger? Do you have a word to say about him?

Mr. Steiger. Yes. You will make Wisconsin big, Mr. Chairman. Dr. Schoenfeld is not from the University of Wisconsin at Green Bay but the mother campus, assuming it is still standing, University of Wisconsin at Madison. I should say I was not one of those who had the privilege of being in journalism school at the university but I had the opportunity of both knowing and working with Dr. Schoenfeld when at that institution of higher education, and I am very, very pleased to have him here this morning.

His testimony is excellent, I think, and what he has done in terms of putting together the question of journalism and ecology is a very, very important aspect of what this bill is all about and, therefore, it is a delight to have you here, Doctor.

Dr. Schoenfeld. Thank you, sir. It is my privilege.

Mr. Brademas. Go right ahead.

Dr. Schoenfeld. To conserve the committee's time, may I simply expand or emphasize on a couple of points I have made in the remarks that I have submitted formally. I have spent some space drawing a distinction between the old conservation education and the new environmental education, all of which may get to be a little tedious, but I think it is highly significant in terms of the mission of the bill.

Secondly, I suggested that we do have the straggering task of doing everything at once. We have to focus on elementary and secondary education, on college and university education, and on adult education. In other words, we have to focus on youngsters, we have to focus on youth, we have to focus on the workers of the world.

What I have chosen to emphasize in this testimony is an instrumentality which I am suggesting we call Regional Environmental Education Centers, which you will recognize is really drawing a lesson from the most successful higher education and adult education venture this Nation has ever engaged in, namely, agricultural extension through the land-grant college and applying it to this new problem, namely, of conserving an environment, which, through one of those tragic anomalies, the land-grant colleges have actually helped us to exploit.

Now, I propose that we simply take this same device and apply it to the problem which Dr. Weidner has already identified, and it is a crucial problem, of developing and distributing adequate instructional materials, materials not just for use in schools but for use by the citizens' groups who are desperately undermanned and underequipped as housekeepers of the environment in contrast to the exploiters of that environment.

I can also see a role for bringing back immediately what have been called the change agents in the community. You can identify a half a dozen. Lawyers, for example, are particularly crucial in environment rehabilitation; the planners and administrators of our growing land use control agencies, the resource technicians of whatever type you find in the field, and communicators and educators.

Coupled with this preparation and dissemination of materials and the retreading, if you please, of community leaders on what could very well be called a crash basis, could be the interplay with the training of new specialists as they come off the pipeline, so to speak; and research in the techniques and content of environmental education, at whichever level it is practiced; because while we have some very good hunches, we really have very little data on exactly how best to bring about that profound change in attitude which Dr. Weidner said is the crucial challenges. You will notice, Congressman Hansen, I emphasized this point, that while there are lots of things we don't know and we can rely on many sources of revenue to prod us into additional discovery, it is what we do know that is not available out on the firing line where these land-use decisions are being made. It is this, what Dr. Vlasin calls the environmental education gap, that I can see being filled by regional environmental education centers. On this point your bill, of course, is quite specific, it literally envisions, as I read it, just this kind of instrumentality.

I will close with those remarks, Mr. Chairman.

(Mr. Schoenfeld's statement follows:)

STATEMENT OF CLAY SCHOENFELD, JOINT PROFESSOR OF JOURNALISM AND WILDLIFE ECOLOGY, CHAIRMAN OF THE CENTER FOR ENVIRONMENTAL COMMUNICATIONS AND EDUCATION STUDIES, AND DIRECTOR OF SUMMER SESSIONS, UNIVERSITY OF WISCONSIN—MADISON

To do something about environmental conservation, redevelopment, and maintenance requires a sense of husbandry, a sense of responsibility on the part of every American citizen—that man-land ethic or "ecological conscience" which Aldo Leopold bespoke. It is unthinking people who pollute the environment; it is thinking people who can effect a "new conservation."

We are talking, then, about environmental education: "a recognition by man of his interdependence with his environment and all of life, and his responsibility for developing a culture which maintains that relationship through policies and practices necessary to secure the future of an environment fit for life and fit for living."

Many ask, what is the difference, if any, between the new "environmental education" and the older "conservation education?" The newer term attempts to do a more precise and at the same time a more comprehensive job of describing our ecological efforts to come to grips with the degradation of man's interlaced surroundings.

In terms of its scope, the new environmentalism attempts to be all-encompassing. Whereas yesterday we tended to treat soil conservation, water conservation, forest conservation, wildlife conservation, and so on as separate units, today we try to understand and explain the ecological unity of all man-land relationships. In terms of its focus, then, the new environmentalism is man-centered. That is, our primary concern has shifted from the survival of remnant redwoods and raptors to the survival of nothing less than the human species itself. At the same time we are not so much concerned about quantities of natural resources as we are about the quality of the human experience.

In terms of its focus, while the old conservation conjured up images of open country, the new environmentalism incorporates the pressing problems of the city. In terms of its emotional underpinnings, the new environmentalism is based more on fear for man's tomorrow than on a love for nature's yesterday. Thus today's "preservationist" is not a lover of wilderness; he is one who fears the four horsemen of "conquest, slaughter, famine, and death." In terms of its political alliances, the old conservation was linked to such orthodox causes as depression pump-priming, national defense, and outdoor recreation; the new environmentalism, on the other hand, encompasses the hitherto unmentionable demands of the neo-Malthusians for population control.

It is in its basic cultural orientation, however, that the new environmentalism differs most strikingly from its antecedent, conservation. The latter, in the words of one patron saint, stood clearly for economic development, for the infinite goodness of American "progress." But environmentalism reflects a growing suspicion that bigger is not necessarily better, slower can be faster, and less can be more.

If anything surely marks this revolutionary nature of both the rise and rationale of the new environmentalism, it would be the recent words of a Republican President of the United States, telling us that "wealth and happiness are not the same thing," that now is the time to "make our peace with nature," and that we must "measure success or failure by new criteria."

Hence the search for a planning strategy for the new environmental education in America. If a national effort in environmental education is to be strengthened, we must (1) identify the audiences, (2) suggest methods, (3) outline an organization, and (4) propose a timetable. In terms of a timetable, I propose that we proceed simultaneously on a variety of fronts. In terms of an organization, I propose that we build "critical masses" of environmental education at the federal, state, and local levels. In terms of methods, I propose that we start with what we have and invest heavily in research that will reveal optimum tactics. In terms of audiences, I suggest three: elementary and secondary school pupils and their teachers, college and university students and their professors, and adults in their roles as leaders of community action and as citizens in general.

Particularly, we need to establish on appropriate university campuses Environmental Education Centers that will focus on the problem of translating resource management policies and plans into action on the landscape through (a) the collation of information about, and the preparation of practical materials on, restoring the quality of the environment, (b) informal instruction and technical assistance carried out directly to local governments, regional instrumentalities, and citizen groups, (c) the refresher education of key practitioners brought back to the campus for work in natural resource policy implementation, and (d) research in adult education theory and practice. Growing national programs of environmental management depend increasingly on state and local initiative and responsibility. "The problem of the states" as *Life* Magazine said in its editorial of Nov. 4, 1966, "is not lack of power or opportunity or even solely of money; it is a shortage of competent public servants." The proposed Environmental Education Centers would tackle the problem directly by up-grading such key community leaders as planners, lawyers, resource specialists, adult educators, communicators, teachers, and public administrators, and by reinforcing them with improved educational materials and professional consultation. The Centers would also be concerned with adult education and communications research.

Why do we continue to have serious trouble translating federal intentions and state plans into timely, sound action on the land? One answer would certainly seem to be it is only at the local and regional level that public policies can be translated into public and private practices, and it is here at the intra-state level where the forces of wise resource management continue to be ill-equipped to deal with the forces of exploitation. The inefficiency with which public agencies and private citizens go about performing the socially essential tasks of environmental housekeeping stem largely from the fact that the technical and organizational skills available to the land conserver or rational planner are normally inferior to those available to the land exploiter.

While we do not of course yet understand all the scientific facts and societal values attendant to environmental quality control, what we *do* know is not being applied on a scale commensurate with the present pace of environmental pollution. At the local and regional level, where most of the decisions affecting the quality of the environment are made, we must address ourselves firmly to laying a basis for action by elucidating the choices in land and water use, relating them to general values and social objectives, instilling in people a desire for constructive change, and providing practical guidelines that encompass integrated rather than unilateral approaches.

The urgency of need will not be met through educational processes of normal pace and dispersion. What is needed now, and for some time to come, is a steady stream of specific skills and resources rifled to the local and regional firing line. We need local leaders equipped with an understanding of the interrelationships involved between their callings and total environmental management, and with a knowledge of the "tools of the trade" in energizing land and water use controls.

To begin to develop and equip a cadre of local resource management leaders it will be helpful to concentrate on those individuals at the local and regional level who typically do or can play the role of "change agents" in conservation. Four such categories of key personnel can be identified: (a) lawyers, (b) planners and administrators, (c) field resource technicians, and (d) communicators and educators.

To retrain all such change agents and to equip them and their clientele with effective education-for-action materials and services will be a role of the Environmental Education Centers. The Centers will also perform related research focussed on improving their concepts and techniques. Initially an Environmental Education Center would assemble from the university and elsewhere as necessary a staff representing overall competence in environmental problems, to include people trained in biology, design, soils, economics, geology, engineering, ecology, sociology, public administration, journalism, education, law, and other environmental disciplines applicable to land-use issues. Their extension function would be the collection and collation of what is known, what has been done, what is being done, and what might be done; the preparation of educational materials, utilizing a variety of media; and the dissemination of information and technical counsel to local governments and citizen groups through institutes, audio and visual media, and consultation. The team would be encouraged to work with maximum speed and practicality, yet with intellectual breadth so that the environmental caretakers on the receiving end develop a sound view of the inter-relatedness of decisions affecting the environment and of the immense complexity of human needs that must be reconciled and met.

At the same time, the Center would provide fellowships for practicing change agents to come to the campus for a year of study focussed on the practical problems faced by those trying to plan, acquire, maintain, and manage lands and waters for public purpose. These professionals would take regular courses and special interdisciplinary seminars, and will also perform research duties in the Center. Appropriate degrees could be awarded to qualified personnel.

In addition to such regional Environmental Education Centers, I envisage a National Environmental Education Program which will make organizational and fiscal provisions for the following main thrusts:

1. At the Presidential level, a National Commission on Environmental Education, charged principally with developing intergrated concepts, methodologies, and materials.
2. At the Cabinet level, an integrated National Environmental Education Center, lodged in the U.S. Office of Education but drawing support from all appropriate agencies.
3. At the State level, Environmental Education Coordinators in each Chief State School Officer headquarters.
4. At the local level, coordinators, curricula, committees, and sites to translate the national effort into action in the school and on the landscape.

It is essential that the Program be multidisciplinary in its posture and multi-process in its programs; unilateral approaches to environmental management have caused many of our present problems. What might be meant by multi-process? A program concerned with the production of new knowledge and new knowledge-seekers, of more and better resource managers, of citizenship education, and of technical counseling and services. What do we mean by multidisciplinary? We mean we are concerned with the total environment of man: its social, cultural, economic, and esthetic, as well as its physical and biological, aspects. To seek environmental quality requires both an understanding of human needs and the needs of a healthy natural environment. The development and management of environmental quality requires contributions by all the arts, sciences, and professions. The end is to bring conflicting forces into functional relationships in an order in which human impact does not needlessly destroy environmental quality and where environmental quality contributes to more fruitful human life, liberty, and the pursuit of happiness. While we recognize the essential importance of strengthening existing disciplines, the essential nature of environmental education looks toward research, teaching, and extension configurations that transcend traditional lines of endeavor and are concerned with the wholeness of the relationship between man and his surroundings.

The rationale for a National Environmental Education Program is simple: it is unthinking people who pollute the environment, and it is thinking people who can bring about environmental conservation, redevelopment, and maintenance. The spirit of the decade is a spirited search for environmental quality. To support and sustain this third American revolution will require an educational program as massive as the problem of human survival.

Mr. BRADEMAS. Thank you very much, Dr. Schoenfeld. You have been a real pioneer in the field to which this bill is addressed and we are all the more pleased to have you with us today. As a matter of fact, I must tell you that it was not until some months after I had introduced, along with Mr. Scheuer, Mr. Reid, and Mr. Hansen, the Environmental Education Act, which was put in on November 12, 1969, that there was drawn to my attention a reprint of your summer 1968 article entitled "Environmental Education and the University," published in the *Education Record*, in which you proposed that Congress pass an environmental quality education act, and needless to say, I was quite struck by the fact that we used the same phraseology.

Dr. **Schoenfeld.** May I say this word is terribly disappointing because I assumed you had merely read my article.

Mr. **Brademas.** Well, thereby hangs a question I am going to put to you. Had I read your article and had I written the bill that sought to implement the recommendations in your article, I think it must be quite clear to you that the bill would not be the same bill that we are considering today.

Now, if what I say at this point is not clear, let me try to explain and then invite a comment from you.

As I read your article, and I would ask unanimous consent that following Dr. Schoenfeld's testimony his article be inserted in the record, you were primarily concerned, and I do not say exclusively from its context, with the support of environmental education at the university level or at the adult education or 2-year college level?

Dr. **Schoenfeld.** Yes, sir.

Mr. **Brademas.** You will appreciate, however, that the principal focus of the bill that we are holding hearings on at this point in time is to provide support for environmental education at the elementary and secondary school level and in community conferences and through the mass media and that the participation of colleges and universities in this bill is for the most part confined to the development of curricular materials, the development of model projects, the evaluation of the effectiveness of the use of such materials in such projects, and teacher-training and that the bill as written, does not contemplate the provision of direct support to colleges and universities for them to offer to their students environmental education.

Are we clear on that?

Dr. **Schoenfeld.** Yes, sir.

Mr. **Brademas.** Are we clear on that distinction? Have I misstated your view?

Dr. **Schoenfeld.** Not at all, sir.

Mr. **Brademas.** But I take it that you are not quarreling with the need to do something at the elementary and secondary school levels, which is the principal focus of this legislation?

Dr. **Schoenfeld.** Not at all.

Mr. **Brademas.** It may well be that we need to take a look at the question of the involvement of colleges and universities in environmental education and the relationship between that enterprise and the Federal Government. It was my own perception, and I do not pretend to be an expert in this field and I invite your comment on this, that given limited Federal funds, that it might be a more creative and useful effort for us to move in that direction insofar as Federal monies are concerned, than to try to put funds into universities for support, for general support rather, if you will, in environmental education?

Do you have a comment? It is a matter of priorities at this time, it seems.

Dr. **Schoenfeld.** Assuming limited funds, and we have to do this, we have made that assumption, I would put my chips exactly where your bill puts them, if I interpret it correctly. That is mainly that you are going to emphasize the upgrading of teachers, the upgrading of instructional materials, and this will inevitably involve institutions where those teachers are trained and those materials can be produced. I am only saying this, knowing the tremendous ticket that would be attached to replicating University of Wisconsin-Green Bays. If money were no object, I might answer your question differently.

I would add this: In my article, I suggested that the Congress ought to take a look at a lot of existing programs to see how Federal moneys now devoted to education might be refocused or redefined with environmental education as a goal.

Let me give you a quick example. If you look at the most commonly used secondary school general science text in this country, you will find that its opening chapter quite rightly talks about the scientific method, and it uses as its illustration of how the scientific method discovers new facts that are then applied to the solution of public problems—it uses how we solved the maleria problem. The only trouble is it ends with DDT as the hero, and not one line about the ecological backlash. You might say this text is old, but it was rewritten, or republished in 1968, and I will also add this text was developed with NSF money.

That is to illustrate there are lots of places that we need to take a look at where our Federal moneys are going and what they are doing.

Mr. Brademas. That example you have cited is a very telling one, it seems to me. I will be talking again with NSF before long with or without your permission.

In fact, I noticed the piece I was reading here published by G. E. Hutchinson in the January-February 1970 issue of "American Scientist," he is the sterling professor of zoology at Yale, if you know his name, and is a member of the environmental studies board and remarks upon some hearings that were conducted before the Senate Subcommittee on Inter-Governmental Relations in 1969 on a resolution to establish a Select Subcommittee on Technology in the Human Environment. He says at one point in the hearings when Dr. Barry Commoner was testifying, Senator Muskie said, "Didn't we all along the way have the scientific and technological competence to identify the side effects, for example, of sewage treatment, fertilizer, insecticides, before we went ahead and put them into production?

"Where was the scientific community? Why didn't they alert us?"

I was struck by this in view of what you just said, Dr. Schoenfeld, because it seems that the scientists, or it would seem to me that the instance you have just given us and the rather telling plea of Senator Muskie there, represents the kind of narrow focus of attitude, that even our leading scientists have in this country and their unwillingness perhaps to adopt the multidisciplinary approach that you and Dr. Weidner and nearly every authority we have heard from on this matter have suggested.

So, I put this question to you in light of these remarks. How difficult is it, and I now confine myself to university level, to get all of these animals in the same cage, all of the faculty, the university professors and others, actually to adopt the multidisciplinary approach that you all seem to indicate is required if we are going to be making advances in this field, or are they so deeply rooted in their own narrow categories that they can't be shaken?

I don't know if it is a fair question.

Dr. **Schoenfeld.** It is both hard or easy, depending, I guess, on the timing and your own state of mind. Dr. Weidner has had the remarkable opportunity to build an institution from scratch and the genius to send it off in the direction that he has chosen, and the good fortune, as he said, to have broadminded support.

At a large, strong, distinguished university like the mother campus at Madison, it is increasingly easy to get people talking together. There are two reasons for this.

First of all, as Dr. Weidner has said, the students won't let us live in little cloisters any more and, secondly, even though there is yet precious little money available for interdisciplinary research and teaching, we are picking up pebbles all over and putting together these kinds of programs.

So, increasingly, it will be possible at strong institutions to build these critical masses of environmental studies. I can't comment on how rapidly this will come about at the college level, although Dr. Hafner at Hampshire College is very optimistic that it will develop there, too.

Well, let me just say in closing, I certainly don't want to blanket all scientists as having failed to alert us. Actually, the voices of alarm have come from the Commoners and the Ehrlichs and the Allens as well as from the social scientists.

Mr. **Brademas.** I think that is a fair point and I don't want to be represented as having engaged in a sweeping indictment. It just occurred to me, as I listened to what you had to say on this multidisciplinary problem, that perhaps the most natural ecologist in this country is a politician, a Congressman, because we have a lot of things swimming around all at once and how you cope with one problem may have an effect upon how you handle another one. It dovetails with your getting reelected and all kinds of matters essential to the survival of the Republic.

Mr. **Steiger.** You don't make statements like that very often to so many people.

Mr. **Brademas.** But the point I want to get at in observing this is that you cannot survive and be effective if you focus on a narrow category, it is just impossible.

What is the magazine "Environmental Education," Dr. Schoenfeld, of which you are editor?

Dr. **Schoenfeld.** This is a brandnew journal created really as a vehicle for stimulating discovery and dissemination of new and better ways of doing just what your bill contemplates; namely, how better can we communicate these environmental attitudes that Dr. Weider spoke of and how better can we educate young people, how better can we bring "how-to-do-it" materials to the firing line of adults?

Mr. **Brademas.** Do you publish it at your university?

Dr. **Schoenfeld.** No, this is an example of the private sector. Dembar Educational Research Services is a private corporation, headed, incidentally, Congressman Steiger, by a well-known Wisconsin Republican, Walter Frautschi, whom you know.

Mr. **Steiger.** Do you have copies or could you submit a copy for the subcommittee?

Dr. **Schoenfeld.** Certainly.

Mr. **Brademas.** That would be helpful. I have one other question.

Some of the students involved in the teach-in testifying before the subcommittee yesterday expressed concern about the fact that this bill would provide support to colleges, universities, elementary and secondary schools, and so on, existing institutions in the educational system, which they argued were not really well equipped to make adjustments necessary to provide effective environmental education.

They argued that the funds should rather be channeled through small, really nonpublic groups of concerned citizens who they say have been the ones who have dramatized the environmental crisis and who might be able to do a better job of educating. Do you have a comment on that?

Dr. SCHOENFELD. It is possible they will turn out to be correct. I am an establishment man, myself, and I think education, or the education establishment, is a dramatic testimonial at any given moment to its responsiveness and responsibility. I would think that with the kind of energizing that this bill represents, you would see significant change on the part of the more flexible educational institutions at whatever level, and those that can't respond are going to fade away, and that is the nature of our society. But it might indeed be desirable for the committee to look at a separate title in the act that would sponsor I guess what you would call "wild-cat" ventures, because, who knows, these may be the forte of what will turn out to be the most innovative approaches.

Mr. BRADEMAS. Mr. Steiger?

Mr. STEIGER. Mr. Schoenfeld, one of the sections of the bill about which I would like guidance is on page 4, a bill authorizing the making of grants to local educational, municipal, and State agencies and other public and private nonprofit institutions for community education on environment quality and ecology, especially for adults.

Do you agree this ought to be done?

Second, is the language appropriate when it says, "Environmental quality and ecology," or ought that to be changed, and third, how does this fit or can we make this fit with what you talked about in terms of extension-type concept?

Dr. SCHOENFELD. No. 1, I find nothing to object to in the wording. I think it is both broad enough and yet discreet enough to be functional. Second, I think this is desirable, that moneys could and should be made available to lay organizations as well as to public institutions.

Third, I think the implementation of this bill will hinge markedly on building a critical mass of competency, both technically and administratively, in the U.S. Office of Education.

It has been tragic that we have not had this kind of resource there. If the bill accomplished nothing else, it would do that; and with the kind of looseness, if you please, in the wording, and a vigorous, savvy, imaginative director of the program, I could see us taking off, and I almost said, "in all directions," and in a sense that would be desirable.

The one thing I would guess we ought to avoid is a mono type of educational approach. Diversity is a good ecological rule and I suspect it applies in education, too.

Mr. STEIGER. I must say, I am struck by the colloquy between the chairman and yourself. I think I recall Peter Drucker accurately in his book. "The Age of Discontinuity." He said, "We can no longer afford the distinction between pure science and dirty politics," and I happen to be frankly very much in favor of your having all of us, both those of us in politics and those in the university, recognizing at least a relatively high degree of mutual responsibility, to learn one from the other, we cannot continue to make the distinction that there are decisions made purely technical and purely scientific when, in fact, they are very political and require a degree of political continuity by virtue of what was said earlier.

Let me go back to a valuable point you raised and I know the subcommittee will get into it. You talked about "forum for redefinition of existing educational programs."

Without being exhaustive in this, I suspect we could go through at least many of the Federal educational programs, title III of the Educational Elementary and Secondary Schools Act, title I of the University Extension Act, National Science Foundation, and on down the list, and find that, in fact, the language of each of those is drawn in such a way that a local educational agency or university or State now, get money for environmental ecological education.

We, in Wisconsin, as I recall, have one title III project which is for handicapped children at Stevens Point which relates to the environment and yet ours is a State that has always prided itself on what it does in this field and yet we have not done well even using existing law.

So, I guess I am asking, is it really the question of redefinition or redirection, or is it more twofold, one, to understand on the part of both universities and local educational agencies that funds could be now available if they developed a project and submitted it for this purpose, and, second, I was particularly struck by your emphasis on the change agency, and I think, I suspect my priority might be more with change agents than either elementary and secondary education. I don't know whether you want to comment on it or not?

Dr. Schoenfeld. I will make two comments. Dr. Brennan is going to be talking about the problems that some environmental education proposals encounter when they hit the establishment at various levels.

Let me just say, if you asked me, "If all you had was x amount of money and you had to pick one priority," I would pick "retraining, retreading the county agents of the country." If I had to pick on one kind of person in whom to bring about an ecological outlook, it would be the agricultural county agents.

Mr. Steiger. I should just interject at this point, knowing full well you have addressed a speech I gave at the Washington Rotary Club, that is the point of the speech I made. I am delighted to hear you say that. I must say I appreciate very much that support.

Mr. Brademas. Will you yield?

Mr. Steiger. Yes.

Mr. Brademas. What about New York City, Chicago, and Los Angeles, where county agents are not in great abundance?

Dr. Schoenfeld. I think the Congressman might be surprised how many we would find there, but assuming, obviously, there are not nearly enough, then I would look for those agencies with field people and frankly, I am not familiar enough with the structure of a metropolitan complex to know who would be. Maybe they are in HUD.

Mr. Brademas. That is precisely my point. "There ain't no such animal."

Dr. Schoenfeld. OK. Then we might have to create them.

Mr. Brademas. Because that is where the folks are.

Mr. Steiger. If the chairman will yield, I am not sure that is entirely true. I would have to check that, but I recall, Milwaukee, for example, does have a county extension service and does have a county agent and does have a field staff. I know they have shifted, for example, in their emphasis toward consumer, homemaking skills, the value of money, and these kinds of things, and I, frankly, John, would think there may well be a network of extension outreach personnel that exists within many metropolitan areas—not very visible perhaps and not very large a staff, but nevertheless there.

Mr. Brademas. I think the thrust of what the gentleman from Wisconsin is saying is very good. The reason I raised my point is only to say we have to do something to be sure that we have the kind of county ecologists or whatever you want to call him in sufficient numbers in the metropolitan areas where, you know, the erosion of the environment is such a problem. I don't think the gentleman would quarrel with that.

Mr. Steiger. No quarrel at all. As I say, at this point, I think that there is a great value to some serious rethinking about what the role of the county agent is. I seriously would think of making him more relevant, if I may dare use that word today, in what is going on in the world around him.

Thank you for coming.

Mr. Brademas. Mr. Hansen?

Mr. Hansen. Thank you, Mr. Chairman.

May I also welcome you to these hearings. You spoke of the change agent in the community. Would it be correct to assume that among change agents are the media? If so, what should be the role of the media in this effort and what aspects is the media fulfilling and what would you determine to be his responsibility?

Dr. Schoenfeld. The media obviously are in the business of selling news and up until a year ago they were not on to this beat particularly, except with some significant highlights. I am sure the Congressman will agree that within the past year environmental coverage has become almost stunning in its scope and breadth and velocity, particularly in the large general circulation magazines and on television, and I am pleased to report that it also is increasing in the smaller dailies that really make up the grist of the media in this country. We have taken a look, for example, at the environmental coverage of the Wisconsin dailies and it has doubled in the past year.

My particular program is designed to turn out better hybrids, so to speak. We try to give a patina of communications to ecologists or vice versa. We are having some success with this. I must say the media are very anxious to employ these young men and women. We find this encouraging.

Mr. Hansen. Thank you very much.

Mr. Brademas. I would make one other observation, Dr. Schoenfeld. I was struck by the sentence in your statement that the "new environmentalism is based more on fear for man's tomorrow than on a love for nature's yesterday."

We at one point in time talked about calling this bill "Conservation Education Act," but it was precisely because I guess we felt much the same way that we didn't do that.

The other thing that struck me about what you and Dr. Weidner have said, if I interpreted you correctly, is that we have enough knowledge or at least we have an adequate body of knowledge and information in this field and what is essential is a change in attitudes in order to enable us to apply the knowledge that we have.

Is that a fair statement? Is that a fair interpretation?

Dr. SCHOENFELD. I would like to qualify it just a little. I think I said that we know a lot more now than is being applied. I am equally sure there are vast areas of unknown knowledge that could very well help in the environmental rehabilitation program. With research being funded at the level it is today, I am confident these new insights will increasingly be uncovered.

The gap, it seems to me, is in translating what we now know into action on the landscape, and as Dr. Weidner says, this is primarily not a technical problem, it is really a part of the political process.

Mr. BRADEMAS. I would ask one more question while you are here. No one has said anything yet about any potential international implications of the activities, of any activities we might generate in the field of environmental education.

I note that George Kennan published an article in Foreign Affairs in which he proposes establishment of some kind of international environmental agency.

Do other countries have activities in environmental education either at the university level or at the elementary and secondary school levels or outside of the educational system in the field of environmental education from which we in the United States might learn?

Dr. SCHOENFELD. Yes, sir. There is a growing international environmental education movement and I would suggest that the committee might very well call Martha Henderson, who is here in Washington on the staff of the Conservation Education Foundation, and the secretary of the U.N. Subcommittee on Conservation Education.

The headquarters of the subcommittee actually is in Switzerland. This committee is planning an international conference for 1972, but Miss Henderson could very well brief the committee on those countries that are, in terms of sophistication, at least, really ahead of us.

Mr. BRADEMAS. That is very helpful, indeed. I have to resist the blandishments of my colleagues who, rather than calling someone in for briefing, would much prefer to visit these countries on the spot.

Dr. Schoenfeld, you have been most helpful to us and I hope that you will allow us later to call on you, as well as Dr. Weidner, for further advice as we get into the bill.

Thank you very much.

(The article referred to follows:)

[Reprinted from the Summer 1968 issue of the Educational Record, published by the American Council on Education, Washington, D.C.]

ENVIRONMENTAL EDUCATION AND THE UNIVERSITY

(By Clarence A. Schoenfeld)

"Because we are figuratively and literally sick and tired of a misdevelopment of America that daily diminishes the quality of the human experience," Clarence A. Schoenfeld calls on the nation's universities to orient their academic programs in research, teaching, and extension systems toward instilling an awareness in their students of the pervasive relationship of man and his surroundings to each other. He outlines the

possible framework and strongly recommends passage of a federal Environmental Quality Education Act to help stem the massive flood of environmental pollution. Dr. Schoenfeld is Professor of Journalism and Wildlife Ecology, Coordinator of Conservation Education Programs, and Director of the Summer Sessions, the University of Wisconsin, Madison.

Our current concern for environmental quality constitutes, in a sense, a third American revolution. We have had our political and technological revolutions; we are now at the threshold of a cultural revolution, marked increasingly by a new man-land ethic. We are figuratively and literally sick and tired of a misdevelopment of America that daily diminishes the quality of the human experience—through water pollution; air pollution; soil erosion; forest, range, and wetland deterioration; waning wildlife; urban sprawl; preempted open spaces; vanishing wilderness, landscapes scarred by highways, litter, noise, and blight—producing a not-so-quiet crisis of decreasing beauty and increasing contamination that threatens not only the pursuit of happiness but life itself.

To support and sustain our earlier revolutions, various educational instrumentalities were developed. To support and sustain our search for environmental quality, we need new educational programs that will discover and disseminate the ecological and economic facts, engineering techniques, and esthetic appreciations basic to an applied conservation conscience. The implications for our institutions of higher eduation are particularly clear. The energies of the campus must be so redirected that those involved in environmental management will be able to share in the skills and resources the university can contribute to the solution of public problems through research, teaching, and extension.

The question of how best to involve the university in a broad strategic campaign against the pervasive degradation of the American environment provokes considerable discussion and experimentaiton. Because goals vary, institutions vary, traditions vary, perceptions of problems vary, and terms are imprecise, there is confusion of counsel. This paper is an attempt to identify parameters and points of departure in a curriculum dealing with the subject of environmental quality. The assignment is not an easy one; the aspects of the topic defy easy pigeon-holing. They keep slipping out of the discrete departments into which universities tend to be organized, and out of the tight compartments into which action agencies tend to consign their tasks.

COMPETING PERSPECTIVES

One approach, for example, would be to examine environmental quality education from the perspective of university organization. The trouble here is that the problems surrounding the improvement of environmental quality defy the traditional pattern of the division of labor within the university which arranges knowledge into a series of subject matter areas concerned with *segments* of the physical, biological, and social sciences, and the humanities. Another approach would be to examine environmental quality education from the perspective of such conservation objectives as the opportunity for outdoor recreation, water quality and supply, forest and field yield, urban beauty, and so on. The trouble here again is that conflicts among competing resource demands are frequent and intense; and it is becoming increasingly difficult to draw any clear quantitative or qualitative lines among the problems. Each specific resource use raises a congerie of questions about man's relationship to his total environment, and the choice of alternatives among competing resource uses involves legal, economic, social, administrative, technological, esthetic, ecological, and ethical considerations that in turn span manifold governmental agency and university department lines.

Any attempt to dissect environmental quality education indeed runs the risk of so mutilating the specimen that it loses its essential characteristic—its multi-disciplinary, multi-process nature. Yet it is necessary that we collate its contents and goals in some way if we are at least to agree on what to disagree. The approach I propose is simply to ask the question:

With respect to environmental quality education, what are the needs and demands of the market for the goods and services of the university?

The university engages in basic research, and in applied research and development. The university supports elementary and secondary education and supports and may even engage in two-year terminal vocational training. The university performs undergraduate instruction, professional education, and advanced scientific training. The university engages in formal adult education, informal counseling, and extension services. Education related to environmental quality should be an aspect of all of these levels of enterprise.

STAGGERING IGNORANCE

The conservation, redevelopment, and maintenance of environmental quality requires more knowledge than we now possess. What we do not know about the earth machine and its denizens is staggering. At the level of fundamental knowledge, we are desperate for criteria and tools with which to measure environmental quality in an ecological sense and in an economic sense. At the level of technology, we lack means and ways of abating, restoring, or controlling. Actually, it is rather fruitless to worry whether the research to be performed is termed basic or applied, or whether we start with a stated requirement and proceed to a solution, or start with a concept and proceed to an application. The important thing is that we ask the right questions—in other words, ensure that the research be cast in a problem-solving climate. Much of such research can be initiated by existing university departments; some will require the development of hybrid departments or at least of special task forces. Again, it would seem fruitless to worry about the "home" of the research. It is most important that each scholar, regardless of his stripe, accept a redefinition of his role and conceptual approach so that he recognizes the problem of environmental quality and its interdisciplinary nature.

Intimately associated with the university's search for new environmental knowledge will of course be the graduate training of researchers equipped to fill the public and private stations where environmental studies will be pursued in the physical, biological, and social sciences. How, in fact, to train such scholars to engage in a more productive cross-fertilization of ideas poses a vital question for the modern university. It is one of those striking anomalies that at the very moment that the problems of the environment are seen as being inextricably related, the university's specialists are becoming ever more specialized. Clearly the watchword of environmental studies must be the production of multidisciplinary knowledge and multidiscipiinary knowledge-seekers.

The conservation, redevelopment, and maintenance of environmental quality requires more managers or operators better equipped to apply present and emerging knowledge. At least three broad types of professionals can be identified. First, there are resource technicians like park managers, geologists, ecologists, meteorologists, foresters, geographers, economists, sociologists, architects, hydrologists, game managers, engineers, and so on. Not only must they be well grounded in their specialty if they are to be immediately employable, but if they are to be promotable, they must be able to relate their discipline or function to that of other professionals and to the larger questions of human values and environmental policy. Second, there is the need for the broad resource genealist—perhaps the rarest of all species—who can deal effectively and creatively with whole policy issues in all of their complexity in a staff or executive role. Third, there must be "change agents" equipped with an understanding of the interrelationships involved between their callings and total environmental management, and with a knowledgeable of the tools of the trade in energizing land and water use controls—lawyers with pertinent legal skills, designers and planners with a grasp of resource policy implementation, communicators and educators equipped to interpret resource problems in such a way as to achieve consensus rather than conflict.

THE NEW PROFESSIONALS

In the production of new professionals, are we talking about four-year, five-year, or six-year programs? Do we start with generalists and make specialists out of some, or do we start with specialists and make generalists out of some? Do we modify, expand, broaden, intensify the curricula of existing departments and schools, or do we invent custom configurations? These are some of the questions presently agitating the university as it faces the training of environmental technicians, public policy formulators, and change agents.

One promising form of environmental management training involves the return to the campus of operational personnel for more specialized or more generalized education, depending on the needs and goals of the selected individual. Such programs may be of the non-credit, professional, refresher type, or they may involve the granting of advanced degrees. Whatever the type or level of professional environment management education, the "student" should be specialized enough to be viable in field operations and broadly educated enough to appreciate the complicated biotic and human phenomena over which he presides. It is no small challenge.

In the final analysis, the enlightened management of environmental quality will proceed only as far and as fast as public opinion will sanction. These are three ways in which the university can assist in producing mass concern for and knowledge of conservation. First, in its undergraduate curriculum, it can confront all students—not just career majors—with the kinds of resource management arguments on which, as citizens and voters, they will render crucial judgments. It can attempt to install a desire for constructive change; it can suggest biosocial standards of values; and it can offer practical guidelines to action. Second, the university can assist the public schools in the development of K-through-12 scope and sequence concepts and materials that will lift conservation education out of any rut of irrelevant or inadequate approaches and techniques. Third, the university can assist two-year terminal technical institutions in developing sound curricula for the field aides who must be produced to fill subprofessional positions in resource management agencies of many types.

Adjustment of Existing Programs. A good deal can be accomplished toward expanded environmental quality research, teaching, and extension through injecting a commitment to environmental quality education into existing federal grant-in-aid programs by amending present legislation. Programs and acts that lend themselves to modification and focus include: cooperative extension programs through the Department of Agriculture under the Smith-Lever Act; elementary and secondary education programs through the US Office of Education under the Elementary and Secondary Education Act; vocational education programs through the Office of Education under the Vocational Education Act; professional education programs through the Office of Education under the National Defense Education Act; adult education and community service programs through the Office of Education under the Higher Education Act; research and research training programs through the National Science Foundation and the National Institutes of Health; research and training programs through the Department of Agriculture under cooperative forestry legislation; research and training programs through the Department of Interior under existing cooperative wildlife legislation and proposed outdoor recreation titles; community service programs under the Economic Opportunity Act and the Department of Commerce; management training and community service programs under the Urban Open Space Act, the Highway Research Act, under the Water Quality Act; and so on.

Regional Centers. A sufficiently broad and coordinated program can probably not be mounted, however, simply by amending various existing acts. It will likely be necessary to provide for the creation of new campus configurations. What might be envisaged is a series of university Environmental Quality Education (EQE) Centers that will focus an interdisciplinary thrust on research and the training of researchers, on professional management education of several types, on citizenship education, and on extension counseling and services—in the classic manner of the land grant college. Whether we should contemplate such a Center in each state is a question fraught with academic, fiscal, and political considerations. Certainly we will need more than a score if we are to generate sufficient varied skills and resources. Each Center need not be identical. It would be well, in fact, if each reflected the particular strengths and slants of its institution and the needs of its region.

Within the flexibility assured by installing EQE Centers at universities which differ somewhat in ethos and structure, it will be important that certain national priorities be achieved. Among the key determinants of success in environmental quality education will be the following:

1. The initial research effort should concentrate on those areas of investigation currently lacking adequate financial support: for example, ecological base studies, the sociology of natural resources, the psychology of landscape consumption, environmental design, public policy formulation, land and water use controls, conservation education and communications, recycle of wastes, and site carrying capacity. We should probably contemplate field experiment stations where emerging principles and practices can be applied and tested.

2. Professional education in environmental quality management must become just that. On the one hand, it must not be a quick, cheap curriculum. On the other hand, it must not be a mere appendage to a research program. Above all, it must be oriented to the public resource, not to a particular consumer of the resource.

3. Citizenship education cannot be left solely to the educationists. Nor can extension services be left solely to the extensionists. Youth and adult education and community counseling demand the time and talent of the best minds the campus can muster.

4. Most crucial of all, it is essential that each Center be multidisciplinary in its posture and multi-process in its programs; unilateral approaches to environmental management have caused many of our present problems.

A BIOLOGICAL NECESSITY

Growing national programs of environmental quality management depend increasingly on regional and local initiative and responsibility. It is only at the intrastate level that most federal policies can be translated into public and private practices; yet it is at this level where the forces of wise resource management continue to be ill-equipped to deal with the forces of exploitation. The inefficiency with which public agencies and privte citizens go about performing the socially essential tasks of environmental housekeeping stem largely from the fact that the technical and organizational skills available to the land conserver or rational planner are normally inferior to those available to the land exploiter. In its traditional extension mode, the university must reinforce local leaders with improved educational materials and professional consultation on environmental quality. While we continue to search for more environmental facts and to train more environmental managers, we can help apply what we already know by placing skills and resources at the local level. Those concerned for environmental quality need data to show that, economically, we can afford such surroundings and that, biologically, we cannot afford anything less. The facts and techniques need to be made applicable and available in localities where the problems exist and where the issues are fought. Local leadership needs a fund of information and special talents on which to draw, including the effective stimulus that would come from knowing the experiences of other community leaders who have met and overcome some of the common problems. Interdisciplinary teams of university extension personnel can collect, collate, and disseminate practical guidelines to community organization and action in land and water use control.

While it would be nice to think that the university would or could engage in a self-energizing program of environmental quality education of adequate scope and depth sans outside help, the fact remains that in the absence of federal funds, this is unlikely to happen, particularly in the face of federal support for educational programs that actually mitigate against the development of interdisciplinary research, teaching, and extension focused on environmental quality. Federal funds, for example, support some water pollution abatement research that is too unilateral; they support some highway engineer training that is too narrow; they support some agricultural extension work in environmental degradation; they support elementary and secondary education programs that have nothing to say about conservation. Until Congress reviews its broad authorizations and appropriations for water management, agriculture, transportation, and urban redevelopment in the context of environmental quality goals, and certainly until Congress invests specifically in such aspects of environmental quality education as are suggested in this paper, it is unlikely that the universities will have the will or the way to enter the picture before substantial sectors of our environment reach a state of deterioration which will be difficult, if not impossible, to correct at reasonable cost and within reasonable time limits.

THE FEDERAL ROLE

In sum, we need a federal Environmental Quality Education Act which will unequivocally state a commitment to environmental quality research, teaching, and extension, and provide segregated funds for such purposes. Such an Act might have the following general provisions:

Centralized Supervision. To make the Act "go," we probably need at the Washington level an environmental quality command post or consortium of command posts that can perform centralized management of ecological surveys and research: establish a systems analysis and management capability within the federal establishment to place environmental quality control on a comparable basis with other national technology programs; and inject environmental quality goals into a wide variety of federal acts and programs having to do with research, professional training, and extension services.

THE TOTAL ENVIRONMENT

This article has already outlined what might be meant by multi-process: namely, a university program concerned with the production of new knowledge and new knowledge-seekers, of more and better resource managers, of citizenship education, and of technical counseling and services. What do we mean by multidisciplinary? We mean we are concerned with the total environment of man—its social, cultural, economic, and esthetic, as well as its physical and biological, aspects. To seek environmental quality requires both an understanding of human needs and the needs of a healthy natural environment. The development and management of environmental quality requires contributions by all the arts, sciences, and professions. Its goal is to bring conflicting forces into functional relationships in an order in which human impact does not needlessly destroy environmental quality and where environmental quality contributes to more fruitful human life, liberty, and the pursuit of happiness. While we recognize the essential importance of strengthening existing disciplines, the essential nature of environmental quality education looks toward research, teaching, and extension arrangements that transcend traditional lines of endeavor and are concerned with the wholeness of the relationship between man and his surroundings. So we must address ourselves to laying a basis for action, to elucidating the choices in land and water use and relating them to general values and social objectives, and to providing integrated approaches to environmental quality conservation, redevelopment, and maintenance based on and consistent with old and new ecological, economic, and esthetic insights.

To implement such postures and programs we need an Environmental Quality Education Act. The rationale for such an Act is simple: It is unthinking people who pollute the environment, and it is thinking people who can bring about environmental quality conservation, redevelopment, and maintenance. The spirit of the times engenders a vigorous search for environmental quality. To support and sustain this third American revolution will require an education program as massive as the problem.

STATEMENT OF DR. MATTHEW J. BRENNAN, DIRECTOR, PINCHOT INSTITUTE FOR CONSERVATION STUDIES

Mr. BRADEMAS. Our final witness this morning is Dr. Matthew Brennan, director of the Pinchot Institute for Conservation Studies. Dr. Brennan, we know you, too, are a pioneer in this field and we look forward to hearing from you. Please go right ahead.

Dr. BRENNAN. Thank you very much.

I would like to take advantage of being the last witness to comment briefly, before I start my testimony on a couple of questions that came up.

I just returned from Venezuela where I spent the last 2 weeks. The minister of education there is in the process of developing a 3-year project for a national environmental educational program from preschool to the university. I am pleased to be serving as director of this project. This will have implications, I think, for the work of this committee.

I have a couple of other things I wanted to comment on but I think in view of the time I will just move on, because I do want to speak specifically to the act itself. I want to make some recommendations and suggestions and some comments. My congratulations to you Mr. Chairman, and to Congressman Scheuer and Reid and Hansen for your leadership in introducing this ball. Congressman Steiger, it is nice to see you here. I want to answer a question you asked Dr. Schoenfeld a minute ago.

The reason there are few title III projects in outdoor education in Wisconsin, Congressman, is that good programs like Manitowoc and Wausau and Poynete and Eagle River weren't qualified under the Elementary and Secondary Education Act which limited to funding to new and innovative projects. So they lost out.

This failure to provide support for on-going projects is one of the weaknesses of the act.

TESTIMONY

If man is the only living thing which can consciously manipulate, control, destroy, or preserve his environment, then a knowledge of his actions and their environmental consequences should be an essential element of his education and of his understanding. It is not, and the reason it is not, I believe, is a failure in American education at all levels.

I believe that much of this failure can be traced directly to a general lack of public commitment to the quality of the environment, which is reflected in the historical lack of attention to education for the environment in the U.S. Office of Education and in the State education agencies.

Therefore, it is with great pleasure that I, who have spent most of my professional life trying to develop a structure for environmental education, note that the U.S. Commissioner of Education is being given responsibility for the establishment of the environmental education program under this act.

This is long overdue. It is a move which has been recommended for years by the Conservation Education Association (about which you asked a question a moment ago, Mr. Chairman, and I will comment later if I might), the Natural Resources Council of America (made up of 34 national and regional conservation and environmental organizations), and, during the past few years, by the Citizens Advisory Committee on Environmental Quality, under the chairmanship of Lawrence Rockefeller.

In response to these recommendations, a coordinator for environmental education was appointed in the U.S. Office of Education. However, in view of the fact that there are presentely, or there have been, 110 projects in environmental education financed under title II of the Elementary and Secondary Education Act of 1965, it is apparent that the U.S. Office of Education is woefully understaffed to make any significant contribution to the development of evaluation of these projects.

SECTION 2. STATEMENT OF FINDINGS AND PURPOSE

So, there is no need for us to spend time discussing the need for this legislation. There is little public understanding of the environment and man's role in the maintenance of its quality, and little public support of activities designed to enchance environmental quality. People are making demands on the environment without understanding the effects on the quality of the environment.

I agree with the language of the bill that "concerted efforts in educating citizens about environmental quality and ecological balance are therefore necessary."

I am also in general agreement with the purposes of the act in section 2b. and enthusiastic about the recommended approach to environmental education through the total curriculum of the Nation's elementary and secondary schools.

For many years I worked, almost alone, for this approach, and, in fact, the curriculum guides for teachers which were developed under my guidance by the State Department of Education in South Carolina and published by Fergusion-Doubleday for national use, still represent the only effort (other than local) to develop a total curriculum approach to environmental education. I noticed the gentleman walking in with a set of the guides just a moment ago, for which I am pleased.

Perhaps it would be helpful to the committee if I commented on each of the program elements under section 3 of the proposed act:

SECTION 3. USES OF FUNDS

(1) Making grants for:

(*a*) Projects for the development of new and improved curriculums. This is the essential first step. However, we should keep in mind two important things—

1. Curriculum development is a lengthy process of writing, testing, revision, retest, and editing. I worked for 7 years on the South Carolina conservation curriculum improvement project, which resulted in those guides. We cannot expect any significant results from projects whose financing is limited to 3 years or less.

2. Many excellent curriculum materials have been produced by the environmental education projects under title III of the Elementary and Secondary Education Act. They should be collected, evaluated, edited, and disseminated to the schools of America, especially those initiating new curriculum projects under this act. We must learn from our successes and our failures of the past.

(*b*) Pilot projects to demonstrate and test the effectiveness of the curriculums developed:

I am pleased to note that these demonstration pilot projects could include projects already funded under title III of the Elementary and Secondary Education Act. In fact, I would recommend that 10 or 12 outstanding title III projects be continued for just this purpose. This could provide some of the regional centers so necessary for full implementation of any national environmental education program.

(*c*) Projects for dissemination of materials and information:

One of the great deficiencies of the title III environmental education projects was a lack of any plan for collection, evaluation, and dissemination, of the curriculum materials produced under clause (a) before demonstration pilot projects are set up, under clause (b). This evaluation and dissemination could be accomplished by the U.S. Office of Education staff or by contract, as indicated under paragraph (2), page 3, lines 14 to 19.

(2) Evaluation. This job of evaluation, in my opinion, should be undertaken before dissemination, as outlined in clause (c).

(3) Teacher training. This is good. However, until curriculum materials are developed, collected, and ready for dissemination, any programs of teacher training will have limited value. One of our biggest problems in environmental education historically has been the emphasis on teacher training for nonexistent school programs, with no curriculum materials for their use.

(4) Adult education. Good. We must move on all fronts at once. I am a little upset about the clause, especially for adults in the bill, however. That is one line 7, page 4. I think we have a great potential in the youth organizations and I think we should not overlook this.

(5) Mass media materials. Good. I understand that a program such as this is already underway by Public Broadcasting Corp.

SECTION 4. APPROVAL OF APPLICATIONS

Here, I am using my experience as a former specialist in the U.S. Office of Education and as consultant to many of these new title III projects. I am pleased to see the role of the State educational agencies spelled out. I might even go so far as to deny approval of the Commissioner if the State educational agency has serious questions as to the worth of a grant proposal under this act. I have worked with the supervisors of science, curriculum, and environmental education in nearly every State, and there is no more competent or dedicated group in this Nation. Their assistance to the Commissioner in his allocation of projects can make an important contribution to the success of the programs under this act.

SECTION 5. ADVISORY COMMITTEE ON ENVIRONMENTAL QUALITY EDUCATION

Your recommendation, Mr. Chairman, and other members of the committee for an advisory committee on environmental quality education is excellent and should be implemented.

SECTION 6. TECHNICAL ASSISTANCE

Good. I would recommend U.S. Office of Education staff members to work with all of these agencies and organizations. All of these programs should also be under the direction of the Commissioner of Education. Only in this way will the competition which exists among the resource agencies be eliminated.

COMMENTS AND RECOMMENDATIONS

A. U.S. Office of Education.

1. Since environmental education involves every program in the U.S. Office of Education—elementary, secondary, higher, adult, vocational, research, and so forth—the coordinator must be of Associate Commissioner rank in order to direct the total program of environmental education at the national level.

2. Specialists in environmental education must be added to the U.S. Office of Education Washington and regional office staffs as the first order of business. We must learn from our experience with NDEA and ESEA, title III.

I was fortunate to be on the staff when we set up the NDEA—National Defense Education Act—program in 1959 and 1960. The U.S. Office of Education was staffed with specialists in math, science, and foreign languages.

These specialists provided consultant services, gave workshops, and generally coordinated a national program. Working directly with State educational agency specialists, also provided under NDEA, they produced spectacular results in improving instruction and curriculum in the designated subject areas.

Under title III, ESEA, no specialists were provided, either in the U.S. Office of Education or the State level. Yet, 110 environmental education projects were funded. They received no U.S. Office of Education assistance in planning, conducting, or evaluating their projects, and no assistance in dissemination of the materials and information they produced.

We must staff the U.S. Office of Education and the 50 State education agencies. The cost of $1.5 million per year, which I estimate will be a sound investment, just as it was in NDEA.

B. State educational agencies should be included under section 3, page 3, lines 1 and 21. In fact, the State education agencies are better equipped to implement the programs included in this act.

C. Funding. Provision should be made in the bill for local participation in funding, with complete local financing after 3 or 4 years. For example, during the first year, 80-percent Federal, 20-percent local; second year, 60 percent, 40 percent; third year, 40 percent, 60 percent; fourth year, 20 percent, 80 percent; fifth year, completely funded locally.

If this is planned, it will be accepted by the local community and implemented. If it is not planned, programs will end when Federal funding ends, as happened with so many fine title III programs.

Since Congressman Hansen is here, I will specifically point out the American Falls, Idaho, project, one of the finest environmental education programs under title III, which has ended. The director and two other members of the staff are now directing title III projects in other States. This is a tremendous loss to Idaho, and it should not have happened.

D. I would recommend that the development of understanding of the problem of balancing the population with the available resources of the earth should be given priority in any environmental education program to be funded under this act.

We are just kidding ourselves if we continue to concentrate on the visible effects of overpopulation—pollution, pesticides, poverty of the environment, the "P" problems, I call them.

It is people who demand resources. Industries only provide them. It is people who produce wastes of all kinds. It is people who demand more and more electricity and power—with the resultant problems of powerplant pollution. At the same time, it is people who demand more outdoor recreation, more open space.

If we allow the population in the United States to double by the year 2000, as experts predict it will, we can spend every dollar in the Federal budget every year and still do no better than keep even with the "P" problems. It is the job of environmental education to help the American people to understand this.

E. I would give immediate consideration to reopening the shuttered Job Corps centers across the Nation as regional centers for environmental education. I believe these centers could be operated on a full-time basis at little or no cost to the Government.

Incidentally, since I wrote this, the Superintendent of Public Instruction in Washington, Louis Bruno, just received a multiple use permit from the Forest Service to operate the Cispus Job Corps Center outside of Vancouver, Washington, as a State center for environmental education. This can be done at no expense to the Government.

The New Jersey State School of Conservation has been self-supporting for most of its 20-year history, with courses and workshops for up to 10,000 teachers and students a year. Next year its budget will be $299,000. The school must return $250,000 to the State, which means a $50,000 cost to the State.

For this, 10,000 teachers and students will participate in 5-day programs of environmental education. The Southern New Jersey Center for Environmental Education, set up under a title III grant, will become self-supporting next year when Federal funding ends.

Incidentally, they did this 80–20, 60–40 funding formula I recommended earlier, and it was planned in the beginning that the local community would eventually take over the funding.

So, we are not guessing. It has been done. It can be done.

F. We should not overlook some of the long-established centers where environmental education has been carried on. May I refer again to some of the programs in Wisconsin, for example, about which Congressman Steiger asked.

Many of these could be expanded with some assistance under this act. One of the tragedies of many so-called innovative environmental education programs financed under title III was the Federal funding of new programs while long-established programs struggled along on a limited budget.

For example, just 2 miles down the road from the New Jersey State School of Conservation, the largest title III program in environmental education in the United States was set up with a budget of $250,000 a year. The future of this program is in grave danger when Federal funding ends this year. This kind of situation could have been avoided by professional staffing at the U.S. Office of Education and State level, and provision for approval of projects by the State education agency.

G. We should consider the establishment of an advanced center for environmental education, preferably a cooperative institute bringing together the combined resources of university, business, and community to serve the Nation's need for a quality environment. Such a center could provide:

1. Conferences on policy and practice in environmental education.
2. Seminars and institute study for leading educators and teachers.
3. Courses and seminars for curriculum planners.
4. Curriculum studies in all subject areas at all levels of education.
5. Preparation of publications to disseminate the deliberations of conferences; findings of seminars and studies; and improved instructional material as developed.
6. Assistance in the development of outdoor laboratories as integral units of school facilities across the Nation.

I have also made preliminary estimates of what the program might cost.

Mr. Steiger. You attached this or am I missing page 13?

Dr. Brennan. I left that out because I was not satisfied with it, sir. I would be happy to prepare a recommended budget, if the committee wishes.

Mr. Brademas. I think it would be helpful, indeed. I do happen to have your page 13 here. Are you suggesting that you would not like to have it in the record?

Dr. Brennan. Well, the Democrats tell me I am modest and the Republicans tell me I spent too much.

Mr. Steiger. So, you better stick with what you have then.

Dr. Brennan. Well, the other thing is I wanted to read all of the hearings and get a little better indication of the direction in which this act is going before I can make specific recommendations.

Mr. Steiger. I ask unanimous consent that at whatever point Dr. Brennan is prepared we submit that.

Mr. Brademas. Without objection that would be agreed to and, indeed, I am sure all of us would be most grateful to have your judgment on this, because you will note that we don't have any specific dollar authorization in this bill and the reason, I think, and Mr. Hansen will agree, I think, is we want to hear from those of you who are going over the figure to tell us what you thought, and then we would make judgments on what we thought was feasible and realistic.

(The document requested follows:)

RECOMMENDED BUDGET

Operations

U.S. Office of Education Deputy Commissioner	$35,000
15 EE Specialists, 10 regional, 5 in District of Columbia	300,000
15 Secretaries at $6,000	90,000
50 State Department of Education EE specialists at $15,000	750,000
50 Secretaries at $5,000	250,000
Subtotal	1,425,000

Program

A. 10 Regional centers at $350,000	3,500,000
(a) *Should—May* be existing centers with capacity to perform in first year.	
(b) To serve as models for curriculum development, teacher training research.	
B. 10 New centers at $200,000 for innovative program development	2,000,000
C. Contract for evaluation, collection, and publication of new materials	500,000
D. Research in EE, Scope, Sequence, Teaching methods—new media	2,000,000
E. Training:	
(1) Teacher, in-service—model centers 5 at $200,000	1,000,000
(2) Teachers, preservice, 5 model centers	1,000,000
(3) Community leaders, 20 at $50,000	1,000,000
Subtotal	11,000,000
E. 4 Government leaders: Service projects (1) to establish cooperative programs	200,000
(2) advisory centers—using resources of land management agencies.	
F. Community projects, 20 at $50,000	1,000,000
Adult education, pre-school-youth, community leaders.	
G. Media, PBC	3,000,000
Subtotal	4,200,000
Total	16,625,000

Dr. Brennan. I wanted to see a little more of the testimony before I made a definite recommendation.

Mr. Brademas. I may say to you we have another person who is engaged in a similar enterprise for us, so we can match up your recommendations with his and see what you come up with.

Dr. Brennan. Mine will probably be modest because I believe what we are talking about accomplishing under the act can be done for very little money.

Mr. Brademas. That is encouraging, if I may say, at least it is encouraging to me.

I want to thank you very much for this statement; it is an extremely valuable statement, Dr. Brennan, because you zeroed in on some of the specifics. In respect of the title III ESEA projects in environmental education, are you saying that if we were to pick up the phone and call the Office of Education and say, "Whoever handles these, please come over and tell us what you have been doing," that there would be nobody at the other end of the line?

Dr. Brennan. There was one coordinator of environmental education appointed last year on the basis of recommendations by the groups I mentioned. I don't have to say any more than that she had 110 projects on environmental education to oversee and she operated without a travel budget.

Mr. Brademas. That is bad.

Mr. Brennan. That is enough said.

Mr. Brademas. I think it would be helpful if we had whatever information is on hand over there on the kinds of curricular materials utilized in the projects as you suggested in your testimony and I take it you are suggesting we ought to pull all of this material together so we can see what already exists?

Dr. Brennan. Yes. I have four file cabinets full of curricular materials produced by title III Elementary and Secondary Education Act projects and they never have been collected, evaluated, edited, or disseminated. It just is a total loss as far as the curriculums in the Nation are concerned.

Mr. Brademas. Let me make this general observation and see if you agree.

It, in part, follows a colloquy. Mr. Steiger and Dr. Weidner said that it may well be possible under existing legislative authority that environmental education projects could be undertaken, some of the kind contemplated under this bill.

On the other hand, not much has been done, and I think one of the reasons for, or one of the arguments for a separate bill of this kind is to dramatize to the country the importance of moving in this field. It is similar to our drug abuse education bill.

We were told by the Administration in July, "Well, you don't need it really because we carry out drug abuse education in the schools without additional authority." We said, "Very well, what are you doing."

They said, "Nothing." And I think that this is one instrument we in Congress have to try to dramatize the importance of action in a field like this. Would you quarrel with that analysis?

Dr. Brennan. I would not at all. In fact, I would say, "Amen, amen, amen." We must have the act, first of all, because of the prestige it gives to the idea.

Second, we must have some kind of coordination. If we just try to do it under existing programs, then it will get lost in the corridors of the U.S. Office of Education, which as you know has a lot of corridors, and there must be a plan spelled out which directs this office and this office and this office, and so on.

In other words, what does research contribute and what does elementary and secondary bureaus contribute and what does the Children's Bureau, Vocational Education and Higher Education contribute? Somebody has to coordinate it at the top or it will never be done.

Mr. Brademas. I take it a corollary of what you said is if there is not some direction, as you say, then nothing is likely to happen, because the tendency is to keep on doing whatever it is you are doing now and why bother to change; is that a fair statement?

Mr. Brennan. Exactly.

Mr. Brademas. You referred to this advisory committee and say you think it is a good idea. We have been told by the ecologists or by an ecologist that we ought to be sure to require that the ecologist be a member of that body and the students yesterday said we ought to be sure the students are represented; I don't denigrate either of these suggestions.

Have you any comments on who must be members of such a committee for it to be effective?

Mr. Brennan. Well, I think I would start with ecologists and kids and go from there. There are a lot of us old fellows that have been pushing around this thing for a long time unsuccessfully. We need ecologists. Of course, I don't think we should try to separate them. I am an ecologist, too, but there are ecologists who are also educators and there are some who are not. I have been working with kindergarten kids developing concepts we used to consider to be the role of fourth and fifth grade science. It can be done quite well with those kids and we don't know, well, at what age children develop concepts in environment.

The other thing is the reason people can conserve are internal, the reason why you and I are interested in environment is the feelings we developed in our youth. They are internal, and if you don't get around to the business of conveying this to kids so they have a feeling of sympathy for environment, we can talk for the rest of our lives about developing attitudes but we would be kidding ourselves. We have to concern the kids and then they will be concerned about environment.

Mr. Brademas. You made the point it was a mistake to rush into teacher training, which nearly everybody has agreed upon the importance, without having good curricular materials?

Dr. Brennan. I am almost alone on this, so don't be alarmed, but I have, as a former professor, trained teachers in environment education and they will write to me and say, "Well, my administrator won't let me do this, I can't take the class outdoors, I can't take a bus for a field trip, and there is no program."

Now, I could give you an even more drastic statement. When the American Broadcasting System program came on, on something about survival, I told my daughter Patti, who is 17, she ought to hear this. She said, "Daddy, I know it is important to you, but I have a test on the geography of China tomorrow and I have to do it and this is part of my program and your environment stuff is not part of my program."

We can't train teachers for a program that does not exist. It can't be done that way. We did it or tried to do it with space science after sputnik in NDEA; I am not all pro-NDEA and anti-title III, ESEA, because we did bad things in NDEA, too, and one was rushing space lessons without materials. We are doing it now with the environment. You must give a teacher materials before you can train her how to use them.

Mr. BRADEMAS. What is the Pinchot Institute?

Dr. BRENNAN. That was a grand design for developing a national environment education center, which did not work out. It was originally set up under a cooperative agreement between the Conservative Foundation and the Forest Service in the Department of Agriculture, and closed because of logistics, difficulty in getting to the place, et cetera. Russell Train, Chairman of the Council of Environmental Advisers to the President, and former president of the Conservation Foundation, conducted a national study with people who came to the institute for conferences, and they decided that logistically it was not the place for an environmental education center and withdrew their support. As of yesterday, the institute no longer exists as an environmental education center.

Mr. BRADEMAS. So, is there any such center in the country today?

Dr. BRENNAN. No, there is not.

Mr. BRADEMAS. Finally, I will put to you the same question as put to Dr. Schoenfeld, are there other countries of the world that have carried on environmental education in so successful a way we might learn from what they have done?

Dr. BRENNAN. There are some who have done things that we could learn from. For instance, Switzerland, has made extensive use of their railroads to bring children to the environment. We had a title III project submitted in Idaho last year, I am not saying it because you are here, Congressman Hansen, but the Idaho State Department of Education Science Supervisor and Social Science Supervisor are totally committed to environment education and one of the projects they presented was for the use of the idle Pullman cars of America to bring kids around and show them the environment, so they are not just singing about "rocks and rivers, rills and tempted hills" and so forth, but going to see them.

As they approached a new region, they would have teacher workshops to teach the children, or go on a field trip or whatever they wanted to do. I told you about the Venezuelan project I am going to direct under UNESCO. We are also going to develop a Latin American center for environmental education at the Simon Bolivar University in Caracas which we hope will be financed by the Ford Foundation.

There are a lot of things going on we can learn from, but it you get the act passed, we will still be ahead. I urge it at the earliest time.

Mr. BRADEMAS. Mr. Steiger?

Mr. STEIGER. Dr. Brennan, I must say your testimony is about the best I have heard in a long time.

Dr. BRENNAN. Thank you very much.

Mr. Steiger. It is extremely helpful to the subcommittee. Let me go through and ask some specific questions, if I may, about some of the points you make.

On page 5, you stress the problem of dissemination of material and information. Let me back up before I get to that. The bill, in its present form, and the chairman and Mr. Hansen can correct me if I am wrong, does not necessarily make possible the creation of an assistant commissioner for this purpose?

Dr. Brennan. No; this was just a recommendation of mine. I don't think we can accomplish the purposes of this act without one. That is just my personal opinion.

Mr. Steiger. Okay. On dissemination, what you are suggesting, and I want to make sure the language is adequate to do what I think we both recognize needs to be done, that is, we need to disseminate curricular materials developed under this act, as well as what was developed under title III of ESEA, for example.

Are you satisfied that the language of subsection "c" is satisfactory to meet that goal?

Mr. Brennan. Excuse me, what page?

Mr. Steiger. Page 5.

Mr. Brennan. I think so. In fact I was pleased that this act does not limit itself to specific projects, in other words, it includes projects under way now under other acts.

Mr. Steiger. Insofar as section 4 is concerned, you raise, and you give the example of New Jersey, something which I think I would like to see the subcommittee work out without getting into the question of State plans versus Federal Government plans, and that is at a minimum a State office has to be involved to an extent on the question of knowledge of the plan or the project and some degree of improvement?

Dr. Brennan. Yes. The Congress and the U.S. Office of Education recognize this. It was during the first year of the Elementary and Secondary Education Act that projects were submitted directly to the office in Washington. As a result, of projects like the New Jersey project I mentioned, they gave the control to a State department of education for the initial application and approval.

This was a good step. All I was doing in my testimony was encouraging this as a definite part of the act. It should be planned this way.

Mr. Steiger. What could we do, if anything, to assure that the pattern established by NDEA to get the specialists is done in this bill?

Dr. Brennan. Just write it in as priority No. 1 and make an appropriation for it. You can't do it any other way, can you?

Mr. Steiger. I must say I don't recall the language of NDEA, whether it was specifically provided for or it was simply patterned into the Office of Education.

Dr. Brennan. One of the titles specifically directed establishment of the jobs of supervisor of science, math, and foreign language in State departments of education. That is one of the titles.

Mr. Steiger. You think that type of pattern ought to be applied in this instance?

Dr. Brennan. Yes. Otherwise, you are going to have the same thing we had in title III, you are going to have projects approved and where do they go for help?

Mr. Steiger. The point you raise on what happened in Wisconsin, unfortunately, is right on target.

We were hurt, I think, by virtue of not being able to get assistance for ongoing programs and, therefore, we looked around trying to develop something new and innovative. I am not sure it was a terribly wise move to make. Are you saying that this committee should not limit anything that is done simply to something new, but rather should also insure that an ongoing program is eligible?

Mr. **Brennan.** Yes, I would very definitely recommend that.

Mr. **Steiger.** The Older Americans Act is as close an example, I suppose, to the concept you proposed in terms of local participation and Federal funding.

I would have to say, Mr. Chairman, that the experience under the Older Americans Act is a good experience. It would be, I think, fairly clear that this concept of seed money worked relatively well and that local communities, knowing that at the end of a certain period of time that they would have to do it, made provision in advance to assure that something which was on-going, which was worthy got supported.

I think, like Dr. Brennan said, I am not sure how we ought to do it or whether in this instance it is something we ought to do, but I am pleased by what you have done and said in terms of the recommendations you made.

I don't know what we can do about that, but I think it is extremely valuable.

One last question and that is in all that we do, you heard the colloquy between both the Chairman and myself with Dr. Schoenfeld, would you concur with Dr. Schoenfeld that elementary and secondary education and adult education are the two highest priorities before we get into the question of university education?

Dr. **Brennan.** I don't have any question about that. We must start with elementary and secondary education. In fact, I would go earlier than that. I think our experience now is showing that some of the inside feelings that I was talking about a minute ago are developed at an earlier age before they even get to school.

But, for the purposes of formal education, it should definitely be elementary and secondary. This relates to a question of the Chairman earlier, the universities are not equipped to do this business of curriculum development. The university people, most of them don't have any idea of what is going on on their own campuses and don't know a thing about what is going on in elementary and secondary schools.

That is the last place I would go for help for curriculum development.

Mr. **Brademas.** Where would you urge it be done?

Dr. **Brennan.** It must be done locally, written by teachers and used by teachers and revised and edited and what have you. Curriculum development is a job of the teacher.

Mr. **Brademas.** With whom would they work?

Dr. **Brennan.** Consultants, with the kinds of people I talk about putting into the Office of Education and State departments of education. They are also present in other organizations. Such as the Conservation Education Associations, made up of 800 dedicated professionals operating on a budget of $5,000 a year. With a little help, those 800 people could be put to work as consultants for these kinds of programs. We have the resources but just don't use them.

Mr. **Steiger.** You agree, don't you, Doctor, that there are in fact opportunities for funds under an existing Federal program or programs, but would I be fair in characterizing your assessments of the effort both by State departments and the U.S. Office of Education as simply having been a lack of focus toward what goes on within each of the various categorical type programs we have?

Dr. Brennan. Yes, it goes right back to my daughter's statement. It is not part of the American curriculum; therefore, it is not a concern of education and it is sort of falling between the chairs and nobody has picked it up. It is not part of our program.

You people are going to make it a part of our program and unless you do, we are just going to spin our wheels and we are not going to do a thing.

Mr. Steiger. You have been very helpful and I appreciate your help.

Mr. Brademas. Mr. Hansen?

Mr. Hansen. Thank you, Mr. Chairman. I would echo my colleagues' comments just to tell you how extremely helpful the testimony has been. It is such a pleasure to tap your very considerable experience in similar programs so that we can take advantage of your constructive recommendations in shaping this program.

I think probably my colleagues would also appreciate your comment of a moment ago on the need to look at the preschool years as the place to begin. As you may be aware, this subcommittee has been devoting much of the last several months to the development of legislation designed to provide programs at a preschool level. I think all that we have learned about the importance of early intervention is applicable to environmental education.

I have only one question which touches on your reference to the accumulation of knowledge, experience and materials, as a result of the program that had been carried on in the past.

Do you see the need in this legislation for some kind of mechanism, perhaps in the U.S. Office of Education, to draw upon the experience of all of the programs that will be stimulated by this legislation or otherwise and to make information available in some understandable and easily useable form to all who could make use of it?

Dr. Brennan. Yes, I think this is essential, absolutely essential. Otherwise, we have lost this great resource we have. As I said, I have four file cabinets filled with excellent curriculum materials that should be in the schools of America today and are not.

Mr. Hansen. Would the U.S. Office of Education be the proper place?

Dr. Brennan. It could have been done in the U.S. office but it didn't have to be. If there was provision in title III of the Elementary and Secondary Education Act for the publication and dissemination of materials, it could have been done.

The Newark, N.J., schools, for example, did set aside some money and published the materials, but it is not entirely legal.

Mr. Steiger. Will you yield. Is there any kind of ERIC operation?

Dr. Brennan. Some of the ERIC materials, some of the environmental education materials have been collected by ERIC at Ohio State University.

Mr. Steiger. Which is the Ohio State ERIC, what field?

Dr. **Brennan**. It is primarily science education. This is another of our hang-ups, of course, we have based a good deal of our environmental education in the past on science, and although we have the scientific knowledge to solve almost every environmental problem we have, the decisions are not being made on the basis of our scientific knowledge at all.

It is economic feasibility, political expediencies, our population problem will get into religion deeply, so you see it is social sciences. And if the people from the wilderness society were here, they would tell you that if the things which enoble man are those which enoble man's use of the environment, then it is the humanities that we are concerned with.

We are actually talking about all of education, every bit from the time you are born until the time you die, all of the disciplines, all levels, a total program of education. People try to categorize this. They say environmental education is just another fad. It is not any fad.

This is total education. That is for the environment for survival of man, total education, it is no category, but a total program of education we are talking about that we must develop.

Mr. **Steiger**. If the gentleman will yield further, the educational media and materials center for handicapped children, one could, I suppose, argue that same concept ought to be applied in this field?

Dr. **Brennan**. Certainly.

Mr. **Hansen**. Well, let me thank you again and tell you that I shouldn't be surprised if we have you come back many more times.

Dr. **Brennan**. I am delighted to be here. This is one of the great happenings of my life and I am so pleased to see you doing this. Pass this bill quickly.

Mr. **Brademas**. Thank you very much. You have been most helpful. We are adjourned for this morning subject to call.

(The hearing adjourned at 12:10 p.m. subject to call of the Chair.)

ENVIRONMENTAL QUALITY EDUCATION ACT

TUESDAY, APRIL 7, 1970

House of Representatives,
Select Subcommittee on Education,
of the Committee on Education and Labor,
Washington, D.C.

The subcommittee met at 9:30 a.m., pursuant to recess, in room 2175, Rayburn House Office Building, Hon. John Brademas, presiding.

Present: Representatives Brademas, Scheuer, Bell, and Hansen.

Staff members present: Jack G. Duncan, counsel; Ronald L. Katz, assistant staff director; Arlene Horowitz, staff assistant; Toni Immerman, clerk; Maureen Orth, consultant; Marty LaVor, minority legislative coordinator.

Mr. **Brademas.** Today we meet to resume consideration of the bill H.R. 14753, The Environmental Quality Education Act.

The Chair would like to announce that the witnesses scheduled for tomorrow are: Dr. Margaret Mead, anthropologist, director of the American Museum of Natural Resources, University of Michigan; and Dr. John Steinhart of the University of Wisconsin.

On Thursday, when we shall hear from Dr. John Cantlon and a number of representatives of several organizations in the field of conservation; and we shall hold hearings on Friday as well.

training, preschool through grade eight, or science materials on the

Our first witness today is James Aldrich.

STATEMENT OF JAMES L. ALDRICH, ACTING VICE PRESIDENT, EDUCATIONAL DEVELOPMENT CENTER; EDUCATION ADVISER TO PRESIDENT OF THE INTERNATIONAL UNION FOR CONSERVATION OF NATURE AND NATURAL RESOURCES

Mr. **Aldrich.** Mr. Chairman and members of the committee, I want to express my appreciation for the opportunity to present my opinions at these hearings.

With your permission, I would like to present a slightly paraphrased version of my prepared statement.

In preparing my statement, I have sought to make a contribution to these deliberations which would stress points that I felt were important but which might not otherwise be emphasized. Thus, I have not spoken in detail of the high priorities which I assign to teacher training preschool through grade eight or science materials on the biophysical environment. Instead I have addressed the need to teach the behavioral sciences in the elementary and secondary schools as part of environmental education.

Mr. **Brademas.** I wonder if, before you proceed, you would be kind enough to identify yourself?

Mr. **Aldrich.** I am the acting vice president of the Educational Development Center which is a regional educational laboratory in New England and the education advisor to the President of the International Union for the Conservation of Nature and Natural Resources.

As I was saying, there is a real opportunity in environmental education, one which I believe could promote a significant reform of education in general. It involves not only the subject matter but the organization of the educational experience.

By definition, it goes beyond the brick and mortar school into the natural and manmade community. It also provides opportunities for the individual to explore within himself the perceptions and interpretations through which he relates to the world.

To a large degree, environmental education is assumed to be a new approach to the teaching of the natural sciences and that all that is needed are some classroom materials on the crises of the biosphere. In fact, the need is for a concentrated effort to develop the materials, teacher training, and style of classroom operation which provide the basis for exploring the vast web of relationships of man with nature, of man with men, of the partnerships which must exist if we are to re-establish a life worth living.

The curriculum material available to the student needs to relate to the world in which he lives. The science, mathematics and social studies instruction must have some bearing on the polluted river that flows near the school, the overcrowded highways, and the oil slick that has closed the local beach. But we must avoid dealing with the symptoms rather than the disease. The biophysical environment is in trouble but the roots of that trouble are to be found in our cultural attitudes toward life and nature.

Our environment is despoiled largely because our culture and the education which reflects it has failed to develop the necessary understandings of important relationships of man in the biosphere. Man is part of nature and man in conflict with nature is man in conflict with himself. The major thrust in environmental education must be towards developing the individual's ability to understand himself as a subject, both individually and in community. Inherent in this understanding must be the self-confidence that he can and does affect his environment.

A working definition of the "environmental education" that I am thinking about might be that education which provides the individual with the materials and opportunities to appreciate his relationship to his total environment or world.

In this sense, it can be conceived of as a collection of interrelated experiences which allow the individual to explore the social, physical, esthetic, and psychological worlds that he inherits. Through these experiences there should be the opportunity to strengthen or develop the student's confidence that these aspects of the environment, his environment, can be changed—and most importantly, that he can effect change.

The last decade has seen the funding and development of a rich array of curriculum materials in a wide variety of subject matter. Curriculum reform has been a significant accomplishment, but educational reform has been minimal. For the most part, the materials that have been produced do not deal effectively with the issues that I am trying to cite here. They do provide a rich resource to draw upon. Perhaps even more accurately the scholars who participated in these programs are a truly valuable resource with which we can take a giant step forward in education.

Two programs that I am familiar with suggest some of the exciting possibilities to be found in environmental education. The fifth grade program, Man: A Course of Study, which has been developed by the Education Development Center is based on the question, "What is human about human beings, how did they get that way, and how can we make them more so?"

Through a series of interrelated materials the student is encouraged to develop a permanent relation to these questions about the essence of human behavior. The other program which is more modest in size, but fully as stimulating an educational experience is being developed by Mrs. Barbara Ellis Long in St. Louis. She has been experimenting with a program in the behavioral sciences within the school setting for upper elementary school children.

The emphasis has been on what she calls projective education through experiments and games with freewheeling discussions by the children of the principles involved and the insights gained. The goal is to develop coping strengths by furthering the students understanding of the human animal and his peculiarities. The point in mentioning these two programs is not to minimize the need for better materials on the physical environment but simply to indicate that they are environmental education too—at least by the definition which I have proposed. Unfortunately, the programs of this type are few and far between. Clearly these are directions and ideas which I believe the Environmental Quality Education Act should support.

Conservation and the rational use of our natural resources are vitally important matters. The environmental distortions which confront us must be corrected if the quality of our existence is to improve rather than continue to disintegrate.

The education of individuals who are knowledgeable concerning the biophysical environment and its existing problems, aware of how to help solve these problems, and motivated to work toward their solution, is an important objective.

But in order to achieve that objective we must appreciate that the environment is both external and internal to individual.

The mutual relations between an organism and its environment are, in the case of man, subject to individual perception and interpretation. Environmental education must embrace these points, or fall short of meeting both the needs of the environmental and the educational crises.

Therefore, I believe that through education we must not only develop a better understanding of our physical environment, but we must foster a deeper understanding of ourselves. Only in this way can we begin to reorientate our priorities in terms of the man/environment relationships and change the behavior or individuals. What I am hoping for is that this act will support environmental education by promoting needed fundamental educational reform.

Given the considerable stresses on society, and the rapid rate of change, we cannot afford the luxury of a formal education which reflects a past; nor even one that deals with today's topical issues. These are not new ideas in education. Perhaps they are more acceptable now because what was seen as desirable education in the past has now achieved the urgency of necessary education.

I am concerned that it is only knowledge of the biosphere which is labeled as necessary while greater understanding of man, the organism, is only seen as desirable.

I believe that the act which we are considering here, or which the Congress is considering, can support this sort of education.

Thank you, Mr. Chairman.

(Mr. Aldrich's prepared statement follows:)

STATEMENT OF JAMES L. ALDRICH, ACTING VICE PRESIDENT, EDUCATIONAL DEVELOPMENT CENTER; EDUCATION ADVISOR TO PRESIDENT OF THE INTERNATIONL UNION FOR CONSERVATION OF NATURE AND NATURAL RESOURCES

It is a privilege for me to be able to express my opinions at these hearings. The need for legislation which supports environmental education is imperative. However, what appear to be the obvious classroom can be deceptive.

Over the past few years the word environment and a small list of words previously limited to ecology or biology texts have become part of the public vocabulary. Air and water pollution, noise level, the population 'explosion' are frequent topics of the mass media. To some people these are largely technological problems which will be solved by improved technology. But to a growing number of people the environmental crises are far more complicated than that. The issues extend as well to the social psychological, political and economic spheres of life. Individual attitudes and values must be changed before satisfactory, longterm technological remedies can be successfully implemented. To many of us concerned with education these crises are the symptoms of more fundamental social distortions which dictate a major re-ordering of educational priorities. We must explore and implement significant new approaches to education and the role of educational personnel if we are to encourage a sense of stewardship toward nature and an improved quality of life.

It is true that the field of education is susceptible to fads and that 'environmental education' could become a fanciful word game with little real substance. But there is for many of us a real opportunity in environmental education, one which promotes a significant reform of education in general. It concerns not only the subject matter, but the organization of the educational experience. By definition it goes beyond the brick and mortar school into the natural and man made community. It also provides opportunities for the individual to explore within himself the perceptions and interpretations through which he relates to the world. Dr. Willis W. Harman, writing on some propositions drawn from the science of subjective experience, has stated, "They imply that the most profound revolution of the educational system would not be the cybernation of knowledge transmission, but the infusion of an exalted image of what man can be and the cultivation of an enhanced self-image in each individual child. They imply that the solution to the alienation and widespread disaffection in our society is not alone in vast social programs, but will come about through widespread adoption of a new image of our fellow man and our relationship to him."

'Environmental education' has already become a title under which many temporary alliances will be found. It is broad enough to include almost anything, but most often it is too narrowly applied. To a large degree it is assumed to be a new approach to the teaching of the natural sciences and that all that is needed are some classroom materials on the crises of the biosphere. In fact, the need is for a concenterated effort to develop the materials, teacher training, and style of classroom operation which provide the basis for exploring the vast web of relationships of man with nature, of man with men, of the partnerships which must exist if we are to re-establish a life worth living. We must not permit the growing demand for new curricula which 'stress' the current wave of environmental concerns to delay needed fundamental research and improvement in education.

The curriculum material available to the student needs to relate to the world in which *he* lives. The science, mathematics and social studies instruction must have some bearing on the polluted river that flows near the school, the overcrowded highways, and the oil slick that has closed the local beach. But we must avoid dealing with the symptoms rather than the disease. The bio-physical environment is in trouble but the roots of the trouble are to be found in our cultural attitudes toward life and nature.

Our environment is despoiled largely because our culture and the education which reflects it has failed to develop the necessary understandings of important relationships of man in the biosphere. Man is part of nature and man in conflict with nature is man in conflict with himself. The major thrust in environmental education must be towards developing the individual's ability to understand himself as a subject, both individually and in community. Inherent in this understanding must be the self-confidence that he can and does affect his environment.

A working definition of the 'environmental education' that I am thinking about might be that education which provides the individual with the materials and opportunities to appreciate his relationship to his total environment or world. In this sense it can be conceived of as a collection of interrelated experiences which allow the individual to explore the social, physical, aesthetic and psychological worlds that he inherits. Through these experiences there should be the opportunity to strengthen or develop the student's confidence that these aspects of the environment, his environment, can be changed—and most importantly, that he can effect change. What this means in terms of the classroom is an atmosphere in which the individual feels competent and equal: competent in that he can deal with the learning opportunities available to him in the classroom; equal in that this role in the learning process is respected and not demeaned, that it is apparent that he has brought something to the learning situation, and that the teacher or learning facilitator also grows from the situation and the involvement with the student.

The last decade has seen the funding and development of a rich array of curriculum materials in a wide variety of subject matter. Curriculum reform has been a significant accomplishment, but educational reform has been minimal. For the most part the materials that have been produced do not deal effectively with the issues that I have tried to cite above. They do provide a rich resource to draw upon. Perhaps even more accurately the scholars who participated in thse programs are a truly valuable resource. These scholars, in cooperation with greater numbers of their colleagues from the behavioral sciences, might open the exciting new vistas in education which must provide the social foundation for the improved quality of life that we seek.

Two programs that I am familiar with suggest some of the exciting possibilities to be found in environmental education. The fifth grade program, Man: A Course of Study which has been developed by the Education Development Center is based on the question, "What is human about human beings, how did they get that way and how can we make them more so?" Through a series of inter-related materials the student is encouraged to develop a 'permanent relation' to these questions about the essence of human behavior. The other program which is more modest in size, but fully as stimulating an educational experience is being developed by Mrs. Barbara Ellis Long in St. Louis. She has been experimenting wih a program in the behavioral sciences within the school setting for upper elementary school children. The emphasis has been on what she calls 'projective education' through experiments and games with free wheeling discussions by the children of the principles involved and the insights gained. The goal is to develop coping strengths by furthering the students understanding of the human animal and his peculiarities. The point in mentioning these two programs is not to minimize the need for better materials on the physical environment but simply to indicate that they are environmental education too—at least by the definition which I have proposed. Unfortunately programs of this type are few and far between. Clearly these are directions and ideas which I believe the Environmental Quality Education Act should support.

Conservation and the rational use of our natural resources are vitally important matters. The environmental distortions which confront us must be corrected if the quality of our existence is to improve rather than continue to disintegrate. The education of individuals who are knowledgeable concerning the bio-physical environment and its existing problems, aware of how to help solve these problems, and motivated to work toward their solution, is an important objective. But in order to achieve that objective we must appreciate that the environment is both external and internal to the individual. The mutual relations between an organism and its environment is, in the case of man, subject to individual perception and interpretation. Environmental education must embrace these points, or fall short of meeting both the needs of the environmental and the educational crises. We are in need of a new ethic with which to guide our lives. There are difficult questions to be answered; questions that must be answered through individual choices. The understanding of how we are motivated to make these choices must be explored as vigorously as the technological solutions to pollution. It will require the combined efforts of many intellectual disciplines to develop some answers to these questions. Educators must be closely involved and seeking to interpret these investigations for use in education programs at all levels. The task is a large one but one for which time is running out. The Environmental Quality Education Act can provide support for this much needed educational reform.

The Act can provide this support by identifying more clearly with fundamental educational reform and stressing the quality of life in contrast to the quality of the environment. In the same sense it would seem stronger to press for new and improved educational programs rather than specify curriculums as the product. In general the language used to cite the purposes of the Act might easily be given a restrictive interpretation. The broad purposes intended for this Bill might well be channeled into conventional projects if the wording does not press for truly innovative and imaginative efforts. Perhaps the Act could include a special category of research projects which would explore the ways in which people perceive their surroundings as against what their environment really is. This sort of research translated into education would have particular value for urban education.

Finally, in Sections 5 and 6 of the Act professional support is provided through the appointment of an Advisory Committee and the provision of technical assistance. Given what appears to be a heavy administrative burden for the Committee, perhaps an advisory assistance group might be organized rather than or in addition to the technical assistance proposed. A real need that must be met and thus the assistance that must be forthcoming, concerns the totality or pattern of relations that should exist between the many projects which unquestionably can be spawned by this type of legislation. A group of professionals drawn from a wide range of disciplines, with the support of staff, time and funding could act as intermediary between the Advisory Committee, the Secretary and other Cabinet Officers and the programs developed under the Act.

Mr. BRADEMAS. Thank you very much, Mr. Aldrich, for a most interesting statement.

I wonder if you could tell us a little more about the workings of the International Union for the Conservation of Nature and Natural Resources, and make any observations you would care to make concerning any international implementations of the effort in the field of environment education.

Mr. ALDRICH. The union is an organization that has been in existence for over 20 years, formed out of the concerns of a number of people about environment, about conservation, back in 1948. It is based in Switzerland and has a large international membership. It is divided into commissions which reflect the various specific professional concerns, such as legal, education, landscape, wildlife, and various other specific topics of conservation.

It seeks to, through various conferences and publications, to bring to the attention of governments and international bodies these particular concerns with a professional understanding, with a professional training.

In the field of education and through my involvement in the Union, I feel that the environmental education aspects are as important on an international scale obviously since the natural boundaries don't restrain pollution the way that people might think they should. There are a number of movements, both within the union and outside the union, in terms of the type of evidence I have been speaking of.

Mr. Brademas. Could you indicate whether there are any other countries in the world that are embarked on programs of environmental education analogous to the kind of things we are talking about in this bill?

Mr. Aldrich. To the best of my knowledge the scope that is being proposed in this bill is not covered. There are many programs in outdoor education and biology in various parts of Europe. These are concerns in the developing programs for this type of education, but there is nothing that I am aware of that is as comprehensive.

Mr. Brademas. I am impressed by your definition of environmental education on page 3 of your statement. You, in effect, define it as a "concentrated effort to develop the materials, teacher training, and still have classroom operation which provide the basis for exploring the vast web of relationships of man with nature, of man with men, of the partnerships which must exist if we are to reestablish a life worth living." You then touch on a subject that I would be glad for you to expand on a little, and I refer to what I take you to be saying, namely, that you are hoping that this environmental education effort could be viewed as an overall effort to reform our educational system generally.

Do I misread you at that point? The reason I raise the question is simply that your position is not unlike the statement made by one of our witnesses last week, who in effect said that we have to change the whole system of American education if we are to be able to make any kind of impact so far as environmental education is concerned.

I can appreciate the force of that argument, but am somewhat repelled by it in that it seems to me to be loading this frail barge with more than it can reasonably be expected to carry. Am I making my point clear?

Mr. Aldrich. Yes, it is quite clear and it is a point which I have been bothered with. There is a tendency, which I have myself, to look at this sort of thing and begin to define it in such broad terms that it becomes hard to manage. However, I sincerely believe that unless we can bring this sort of broad attack to bear upon the educational problems, we really will not get at the problems of environmental education.

I believe it is a fundamental education reform that is needed and that it will require the talents of people who have worked in curriculum reform in the past and have a liaison with groups that are just coming to this really significant area. I really feel that we would fall short, very far short, of the object of your legislation if we did not proceed in this way.

I merely want to go further and cite that we have had a fair amount of curriculum reform which is, for the most part I think, brilliant work which has brought into the field of education, scholars who would not normally be involved in concerns of elementary and secondary schools. But the curriculum reform has essentially in my belief—and these are personal beliefs, I should stress—very rarely prepared us to do the job of education—let me rephrase that.

We are essentially teaching the same subjects with better materials. I believe that we cannot do it that way. Education does need reform and I think this education legislation must contribute to it.

Mr. Brademas. I can sympathize with what you are saying. There has been referred to this subcommittee a bill that I introduced and which is the administration bill, to establish a National Institute of Education. Among the subjects that I would hope we get into would be the whole area of educational reform to which you have been referring.

The only concern I have, however, is that if one logically follows through your points that it would make serious headway in environmental education—I would push it a step further and say, then, you have to make fundamental changes in American society.

I don't think you disagree with that proposition.

Mr. Aldrich. No; not at all.

Mr. Brademas. If you come to that point in time, I would have to say—well, I agree, but as a legislator I am only in that line of work partially. We here have to be incrementalists. We can't reshape American society through its environmental education bill. I suggest if we were going to adopt your point of view, we would stop the hearings today.

Mr. Aldrich. I hope that would not be the case.

Mr. Brademas. I am suggesting we move ahead in a piecemeal fashion, as it were.

Mr. Aldrich. Your point is quite clear and I would hasten to say that the Environmental Quality Education Act should not be expected to include the whole thing all at once. I would hope that it can provide the opportunities for programs to develop which will give us insights of this sort; that it will be defined in terms of the relationship to major educational reform.

Mr. Brademas. I think we are on all fours. You spoke of curriculum development. We are familiar with some of the splendid work that American physicists have done in helping the teaching of physics in the high school level in this country. What is going on, if anything, in the way of cooperation between university people in the whole spectrum of environmental studies and elementary and secondary school people in developing curriculums for environmental study for use in the schools as distinguished for use in the university?

Mr. Aldrich. There is considerable activity in the area of natural science. You will be hearing some testimony from Dr. Stapp on this area. There are a number of people in this country who are working in this way. I am not sure of any major curriculum efforts of the scale that have been supported by the National Science Foundation and other agencies in the past.

Mr. Brademas. Nor am I, and that is one of the reasons that I hope your testimony on page 3, in which you say, "We must not permit the growing demand for new curriculums which 'stress' the current wave of environmental concerns to delay needed fundamental research and improvement in education" would not mean to indicate that we really are making substantial headway in the area of developing environmental studies curriculums for just elementary and secondary schools in this country.

Mr. Aldrich. No, far from it.

The statement was really meant to direct hope that this legislation would contribute to a continuing reform.

Mr. Brademas. So, we are in agreement that we need to do more work in curriculum development. Who ought to be doing it? I think the bill, as is drafted, is suggesting that a good deal of it be done by colleges and universities.

Do you have any comment coming from EDC on that point?

Mr. Aldrich. Obviously I would hope for the university scholar involvement; I would hope for the involvement of organizations such as EDC. I think there must be ways found to support local development in school systems. I think this sort of thing is possible. It might be that the university scholar should relate directly to the school system rather than the schoolteachers going through what are essentially university programs.

Mr. Brademas. I have a couple of other questions, but I will yield to Mr. Hansen and if he doesn't ask them, I will.

Mr. Hansen. Thank you, Mr. Chairman.

We appreciate your helpful testimony here this morning. My questions relate to the same line that the chairman had pursued. I noted in your testimony you say, "The biophysical environment is in trouble, but the roots of that trouble are to be found in our cultural attitudes toward life and nature."

This seems to reinforce other testimony that we have had in these hearings—and I can't disagree that this is the root of our trouble; nor can I disagree with the main thrust of your testimony that emphasizes the need for some basic reforms in our entire educational system.

My question is whether you believe that this bill, with its fairly limited and specific objectives, can carry us in that direction, however small and modest a step it might be, the bill being limited to the kind of specific programs that involve curriculum development, pilot programs, evaluation, teacher training, programs in the community to emphasize the threat to the environment, the causes of the pollution and some of the remedies.

Is this bill properly framed to help achieve the objectives that you have identified, and with which I agree, in your testimony?

Mr. Aldrich. Yes; I would certainly feel that it can contribute to the concerns that I have for educational reform. I would hope that the definition of environment could be broadened to allow for some work in these other areas.

The reaction I have myself is that it reads "the physical environment"—and I really do not believe that curriculum on that topic alone is enough. A rather loose definition of ecology is the relationship of an organism with its environment. I believe we have to understand the organism as well as the environment. We must go into the area of the behavioral sciences and the social studies, more than into the natural sciences alone.

Mr. Hansen. Some of the witnesses who have testified in these hearings have suggested, as the chairman has noted, that maybe we shouldn't confine our efforts too much to the educational institutions. What comments do you have with respect to the value of reaching out into the community, in the noneducational institutions and organizations to carry this effort forward?

Mr. Aldrich. This is an area which I cannot really speak too effectively on. I have qualms that not many people can. I think the greatest possible involvement of the community should certainly be explored.

Mr. **Hansen.** Within the educational community, where should the emphasis be placed, looking at the elementary, secondary, university, preschool?

Mr. **Aldrich.** My own very strong feeling is that it should be at the elementary through junior high level. Even more specifically on the teacher training aspects, both preservice and inservice education is going to be perhaps the hardest to tackle in many respects, because we are asking for many people to work in a way which they themselves are not familiar with and we are asking them to teach in a way that encourages behavior which they themselves do not follow.

Mr. **Hansen.** If another piece of legislation before this subcommittee is approved and implemented, one in which the chairman and myself are deeply interested, that is a bill that would expand and improve and strengthen programs of preschool services to children, do you think there is a proper place in those programs for the kind of environmental education you referred to in your statement?

Mr. **Aldrich.** Without question I think that is one of the best places to begin. Everything supports this; that many of the attitudes which I am seeking to redress, as they effect our natural environment, are formed at that stage. I put my stress on the very early stages; yes.

Mr. **Hansen.** Thank you very much.

Mr. **Brademas.** Thank you.

Just one question. I believe you have done work in educational development in Africa. Would you draw any conclusions from that experience with respect to the kind of science and social studies programs that I understand you have been working on in those countries, for the kind of environmental education you think we ought to be supporting in this country?

Mr. **Aldrich.** May I just briefly state something about that work in Africa, which is that we have been working in curriculum development in mathematics, sciences, and fostering some interest in social studies. This has been going on for about 7 years.

The feeling that I have very strongly is directed in terms of supporting African initiatives and African needs. So my opinions reflect their concerns in this matter.

The development of curriculum materials has been very much in this direction in science and social studies in particular. They are certainly moving in the direction that I am addressing here. It would not be as behavioral at this stage in terms of the materials they are going into. They are much more concerned with national identity, I think, and the relevant areas of the social studies.

Mr. **Brademas.** I think I have exhausted the questions I was going to put to you. We are very grateful for having you come.

Thank you.

Mr. **Aldrich.** Thank you.

Mr. **Brademas.** Our next witness is Mr. Rex Allen, president of the American Institute of Architects, who I hope will introduce those who are accompanying him.

We are glad to have you with us, Mr. Allen.

STATEMENT OF REX WHITAKER ALLEN, PRESIDENT, AMERICAN INSTITUTE OF ARCHITECTS; ACCOMPANIED BY JAMES PRATT, CHAIRMAN, JOINT COMMITTEE ON PUBLIC EDUCATION, AIA; AND TAYLOR CULVER, IMMEDIATE PAST PRESIDENT, ASSOCIATION OF STUDENT CHAPTERS, AIA

Mr. Allen. Thank you, Mr. Chairman.

My name is Rex Whitaker Allen. I am a practicing architect from San Francisco, Calif., and president of the American Institute of Architects (AIA), a professional society representing over 24,000 licensed architects. Accompanying me today are: James Pratt, a practicing architect from Dallas, Tex., and chairman of AIA's Joint Committee on Public Education; and Taylor Culver, a Howard University architectural student and the immediate past president of the Association of Student Chapters of the American Institute of Architects.

The American Institute of Architects strongly supports H.R. 14753, a bill whose general purpose is to promote greater understanding of environmental considerations by developing special educational assistance programs. We commend the sponsors of this legislation for their foresight.

One need only look around this country today to appreciate the lack of understanding Americans have shown for their environment. Indeed, as a nation we have become so accustomed to pollution that it takes something really shocking—like a burning river—to catch our attention.

Recently government has passed more and more legislation to fight such things as air and water pollution, strip mining, Grand Canyon flooding, redwood cutting, and landmark demolition. Witness the various air and water quality acts, bills to protect the redwoods and national forests, and legislation enacted in recent years to protect important historic and cultural assets.

Now, however, Congress must begin to check the destruction of environmental quality before it starts. The first measure to be enacted in 1970, the Environmental Quality Act (Public Law 91–190), is indicative of this new legislative approach. Congressional investigation into a national land use policy, urban growth, and environmental quality education further underscores the concern about heading off environmental problems before they occur, rather than responding to damage already done.

If concern for the environment is to be more than a fad of the 1970's, we must equip the average citizen to make rational judgments on environmental matters. If public concern is to be translated into action, the public must become more astute, it must be able to challenge professionals, pressure groups and even politicians on environmental issues. To do this constructively the public must be aware: it must be educated.

We believe that a quality environment can be furthered through a long-range extensive education program directed both to children and adults. Before we begin such a program, however, we must be sure that our definition of "environmental quality education" is not limited or haphazard. We must know what our goals are and how we can teach people the means to achieve them.

Environmental quality is not only conservation of natural resources, or the preservation of our streams, lakes, and forests. It is also quality in one's own home, in one's own neighborhood, and in one's city. Our manmade environment requires attention parallel with nature. Visual pollution, urban physical deterioration affecting social processes, and misuse of land are all examples of the destruction of the built environment.

Education for this kind of total awareness requires a multidisciplinary approach. There is need to make clear that curricula include the concept of quality of effects and the subject of buildings, neighborhood, streets, highways, drainage, historic and cultural factors, and all other manmade elements in the environment. Environmental education is not only art, social studies, and science, but also mathematics, history, and every other academic discipline. We cannot allow traditional compartmentalized thinking to blunt the effectiveness of this program.

The enactment of such an education program would instill in the citizen an ability to foresee the long-range consequences of man-made projects before they occur. Planning and design with these consequences in mind could then serve as the primary means to insuring environmental protection rather than penalizing violators after the fact.

Accordingly, we suggest that in the committee report on the bill the word "environment" be defined to include not only natural resources, but also the built environment, including important historic and cultural aspects of our national heritage, both of which must be considered as relating to each other and forming the whole.

Many private organizations have undertaken a variety of programs to stimulate public concern. For instance, the AIA sponsored a $100,000 "Study of Education for Environmental Design." What emerged from the study was a process for planning and evaluating new programs that are needed if we are to educate individuals who can work together to build a more human environment. We have provided the subcommittee and its staff with copies of the study.

In line with the results of this study, we recommend that section 3(a)(3), defining those eligible for training for environmental controls, include professionals, especially those with the responsibility for the creation of physical products.

There are other examples of what the private sector has done in the field of environmental education, recently:

The AIA provided a $10,000 grant to our Philadelphia chapter to develop texts and teaching aids to promote environmental awareness at the junior high school level. These aids were tested in the Philadelphia school system and are now in use in other school districts in the United States.

We have engaged in a $200,000 nationwide advertising campaign to pinpoint environmental ills and what can be done about them. Perhaps you have seen one of our advertisements in Time, Fortune, Harpers or the Saturday Review. Incidentally, this program has generated over $2 million in public service TV time.

We call our efforts to your attention as an example of what many concerned groups have been doing. Our efforts will continue, but they are not enough. Federal support of environmental education programs is important if the good intentions of both public and private groups are to have a significant impact on the public's awareness.

To take full advantage of private initiative, we suggest that section 3(a)(5) be broadened to authorize the Commissioner to make grants to, or enter into contracts with, institutions of higher education and other public or private agencies, institutions, or organizations for the preparation and distribution of materials suitable for use by the mass media in dealing with the environment and ecology.

We appreciate the opportunity to present our views. If there are any questions, we shall do our best to answer them.

Mr. **Brademas**. Thank you very much, indeed, Mr. Allen. Do any of the other members wish to speak now? Perhaps we should just go ahead and put questions to you, sir.

Let me ask this rather fundamental question. To what extent is the American Institute of Architects prepared, by their education and training, to be concerned by the impact of what they design on the environment and seek to persuade their clients of the importance of attending to that problem as distinguished from serving the needs of the community without paying much attention to broader environmental issues?

Mr. **Allen**. I would say that by training the profession is well prepared. On the other hand, perhaps we have not been, as a profession, sufficiently concerned in the past to exert the kind of influence that we should. We have become a great deal more conscious of this in the last few years and I believe that, as a profession that is trained to be concerned about visual matters, we are in a position to be of great assistance in pointing out the environmental problems which we have possibly helped to create in the past.

I think there is a much greater sensitivity now to the overall effect of the design of manmade environment and what it does to the community and there is a growing sense of responsibility on the part of the profession of architecture to make known to the client the real problems of it, particularly in urban areas. I think there is a much greater responsiveness to the user needs rather than simply the clients' needs.

We have seen a dramatic change in the past generation or so from the individual client to the corporate or Government client that represents the public. In my own practice, which is primarily in hospital work, I have found that whenever I could show that it was in the best interest of the users of the facility, it was very easy to persuade the board of directors or the responsible authorities that they should take that view.

I think this is the kind of approach that the entire profession is becoming much more responsive to.

Mr. **Brademas**. I might invite both Mr. Pratt and Mr. Culver to comment on the extraordinary proliferation of ugly buildings in this country. Somebody did it. If you can't count on the architects to educate the layman, where are we to turn?

Perhaps I shouldn't mention it—but I remember very well putting a question to one of your predecessors several years ago when we were considering the 1965 Elementary and Secondary Education Act, asking him what AIA had been doing in the way of thinking through the implications of this significant new Federal program to provide educational opportunities for children in disadvantaged areas from an architectural point of view.

The response I got was absolutely horrendous, in my opinion. "We are technicians." I said I was brought up to believe that people like Thomas Jefferson and Leonardo Da Vinci really told what architecture was all about. I take it what you are saying is that there has been a change of attitude and a little "soul" is coming into architecture.

Mr. ALLEN. I would sincerely hope so. Obviously, people don't change overnight, but the emphasis has definitely changed. The AIA particularly has been very responsive to this within the last 5 years. Our whole orientation is much more toward developing a sense of public responsibility.

We are thinking of the letters PR—which we used to call "public relations"— as now standing for "public responsibility."

Mr. PRATT. I think my generation would be with you on Thomas Jefferson and Leonardo Da Vinci. I find, in my relationships with professional schools, teaching architecture, planning, and urban design, that they are indeed very socially conscious to the point that we almost do not consider visual values in the school training at this point.

The great influences are all from the behavioral sciences and what students are thinking about today, particularly the anthropologists' viewpoints on how space affects personal psychology and the art of living.

Our profession, as a whole, plus the planning profession, plus the urban designers that lie between us, are all beginning to worry much more about the overall relationships in the environment than they have in the past.

We can see this from some of the efforts of our profession that Mr. Allen mentioned, particularly educational efforts that have been undertaken in Philadelphia called—I have a copy of it here—"Our Man-Made Environment, Book 7" for the seventh and eighth grades basic use. You will find in this that there are questions such as what are the components of a neighborhood: what do we need to have near our dwelling in terms of public services and public facilities and how do these factors influence our living patterns, our choices, what age we are; factors that have never really been considered in educational terms before.

Mr. BRADEMAS. Mr. Culver.

Mr. CULVER. When you ask the question about are we prepared through our education to deal with these problems, I don't think in the past that the educational system was set up to concern the architects with the issues that are with us today.

I think what is coming about today is an in-house change within the AIA and many institutions concerned with it as an issue. We are better educated to deal with it than others.

I don't think we are the best educated. There is a long way to go as I look at it. I like the remark about the profession 5 years ago and I think you can tell that there have been great changes even by looking at the makeup of this panel.

I am sure I wasn't here first. I am sure it didn't have the color that this organization has at this point. I think the students in the AIA and in all organizations in the world have moved to a point of environmental concern that hasn't been shown before.

This is a healthy new attitude that, as far as students are concerned, puts us in a position of pushing those who are responsible for making changes.

Mr. Brademas. To what extent, gentlemen, are architects and consulting engineers participating in the teach-in across the country?

Mr. Culver. I can't say for architectural students as a group. I can only say for myself. I am going to be a participant because I am a part of a firm of new young guys, and this is primarily why we got together. We want to shed the old traditional way of practicing architecture and become more concerned with environmental conditions.

I will be a participant.

Mr. Allen. I think there is a significant participation by the profession as well, by the chapters of the AIA. It isn't as much as I would like to see. We have sent out literature to all of our members to encourage participation and it, of course, is a local matter.

The programs vary across the country, depending upon the local school involvement. There isn't any read answer so that I can say, "You know, we are doing such and such every place."

There has been a definite attempt to encourage the profession to be involved with this teach-in.

Mr. Pratt. I will add to that that, in my city, young professionals are very interested and committed to the teach-in program and have been pushing the older members of the profession in this regard. They are speaking to secondary schools on that today and I can name at least 10 of them in my city.

Mr. Brademas. Mr. Sowers, did you want to say anything? I will come back to you a little later on. If you want to comment on that question, feel free to do so.

Mr. Sowers. I will comment later.

Mr. Brademas. I would like to observe, from my own point of view, that architects have a unique role in helping educate people in the communities of which they are a part, to be concerned about their environment. You are professionally educated in that area and I should like to express my own hope, in any event, that we will see an expansion of the initiative that your testimony here clearly represents so that we can look to architects across the country to provide significant and substantial leadership in the whole environmental field.

Mr. Allen. My own chapter in northern California, in San Francisco, has been working now for a couple of years on an outline of input into the social studies curriculum that is being tested in schools in Marin County, which has elicited a very great interest on the part of the State system as well.

After the testing period, hopefully it will be introduced into the State guidelines.

This is a program that goes all the way from kindergarten to eighth grade. It is quite an extensive effort. It has involved 12 committee members over the period of the past 2 years. We have had some funding from the national organization now to the chapter to bring in consultants to help to polish the program and make it more suitable.

The emphasis is very definitely on developing environmental awareness, and visual awareness, not on esthetics, per se, and certainly not to encourage people to become architects, but rather to improve the decisionmaking climate of future generations. It is a long-range program.

Mr. BRADEMAS. Yes, Mr. Pratt.

Mr. PRATT. I would like to add that the national AIA has a committee on this subject and we have just surveyed the various components of our operation. From what we can identify in other areas in education for environmental matters, we find that there are some 35 components of our organization which are presently undertaking projects in this area. Some of them are not extensive and are very modest, but some of them are quite ambitious in their relationships to primary and secondary education particularly.

Additionally, we find there are some 25 efforts, nationally of other interested groups producing materials for primary and secondary education, particularly. Only some four of those are, at present, commercially available and are, to us, meaningful in terms of what we see as important values for environmental education.

So, there is a definite need for further funding for the enlargement of this process if we are going to significantly influence public attitudes on the subject.

Mr. BRADEMAS. Thank you, Mr. Bell.

Mr. BELL. You are touching on something that I was going to ask. Is it your feeling that the environmental situation as it involves the architectural design of school facilities is in such shape that some legislation should be incorporated into the present bills to enhance such efforts?

Mr. ALLEN. I wouldn't feel that this was particularly appropriate to this bill. It would seem to me that, if I understand your question correctly, this is another matter, that what, as I understand the bill——

Mr. BELL. Not necessarily this bill. Any type of educational facilities bill involving elementary or secondary education.

Mr. ALLEN. I would suspect that it is pretty hard to legislate good design. You have to have a public that demands good design and then you will get it. But to legislate what is good and what is bad, is very, very difficult.

Mr. BELL. I didn't mean exactly to legislate design. I meant to encourage awareness of certain areas in which certain types of architecture would be reasonable.

Mr. ALLEN. I think this would be very difficult to do effectively, because like any other product, the product of the architects' design which results in a building can only be judged by a public that is capable of making a decision on whether it really is good or not.

One of the major problems, of course, is that we have had an emphasis on immediate cost rather than on the total life cost of a building; that the life cost of a building includes what effect it has on the community. This is something that the decisionmakers, who are responsible in fact for making the decision on what kind of a building should be built, need to be more sensitive to.

This would be hard to legislate.

Mr. BELL. The thought just occurred to me that somebody on this committee suggested an amendment about 5 years ago to make the school of architecture, within certain guidelines, more attractive.

I am wondering what would have happened if it had passed.

Mr. Allen. I feel, Mr. Bell, that the legislation would not have prevented the problems from happening. This kind of legislation could create more problems than it would cure simply because it is so difficult to write into law, or to determine in a legal fashion, what is bad in terms of design.

Mr. Bell. Mr. Culver, do you want to comment?

Mr. Culver. I am not quite so up tight with it. It wouldn't bother me if the persons that would draft this kind of bill would have people that were educationally sound in this area. I would be against it because my premise is that the educational system does not have these people.

Mr. Pratt. I would like to add to what Mr. Allen said, that a good building must reflect the processes that go on within it. If you analyzed the kind of literature coming out today, particularly from the educational facilities laboratories, which attempt to do this in the purview of school building designs, it seems to me that there is major focus being placed on new kinds of education and the buildings that will, and should, result from them.

If you are considering legislation in this regard, you should certainly look at the Educational Facilities Laboratories report.

Mr. Allen. I would add one further comment to this question. It is always necessary that an architect have a good client if he is going to have a good building. It is a two-way proposition that isn't just a matter of very talented architects producing a work of art; particularly nowadays, it has become more and more true that the process of design is one that involves many different people, and that the architect is only one part of this process and is equally important.

That is why we are such enthusiastic supporters of this bill, because we see, in the long run, that this will produce a climate in which better architecture will be accomplished.

Mr. Brademas. Mr. Hansen.

Mr. Hansen. I join my colleagues in extending a warm welcome to you and our appreciation for your testimony which has been helpful and reassuring. I appreciate some of your constructive suggestions for amendments that might be considered to this bill and I think you have properly identified one of the objectives that we should keep in mind as improving the quality of what you termed "the built environment."

In looking at changes, for example, in the curricula of the architectural schools, have you found changes responsive to the goals that you make reference to here as far as enhancing the quality of the built environment?

Are the changes coming about as quickly as they should?

Mr. Allen. I am sure they are not coming about as quickly as they should. They are coming about, but, obviously, one is impatient to see these things happen faster. I think the architectural schools across the country are generally reexamining their curricula; there are significant changes taking place.

They do, very much, conform to the suggestions we discussed here this morning.

Mr. Hansen. Do they reflect what you referred here as the "necessary multidisciplinary approach"?

Mr. Allen. Very difinitely. This is, however, only the inception and I think Mr. Sowers would like to speak to this point, too, because there is a real need to devlop a closer coordinated action, not only with the traditional design professions of achitecture and engineering, but also with the related fields of sociology, economics, and so forth.

Mr. HANSEN. In looking toward these changes—where is the principal leadership coming from and where is the major resistance? The institutions—that is, the schools—the profession, the AIA, the clients that you serve?

Mr. ALLEN. I feel that the resistance is the resistance of an institutional establishment, traditionally.

There is some resistance on the part of the profession, the men who find it is becoming more difficult to get the kind of talents from the schools that they need because the students are more interested in doing other things than the traditional kind of architectural practice.

I think this resistance is diminishing, however. But, it does exist and it may be that we have to develop a different approach to providing talent specifically for this purpose.

We have had some work done in the development of technicians training programs, to provide the supporting personnel that will be needed in a manner similar to the medical professions, medical technicians, that have developed so rapidly.

I hope that any such programs as they are developed would always leave the door open for people to go in and become professionals, if they chose to do so.

I think that the public, as a whole, has not been a restraint. It is inertia and this is gradually being overcome.

Mr. HANSEN. Let me ask, also, to what extent budgets, fund limitations, are a factor? I gather from your earlier comment that at least this was the implication I drew from your remark that when all of the costs are taken into account, the design that is best from the point of view of achieving the objective of an improved environment need not necessarily be the most expensive.

To what extent do we encounter this conflict between what is the best or the most acceptable design from the point of view of environmental quality and the one that is the most expensive?

Mr. ALLEN. If I understand your question, traditionally, we have looked at the immediate construction costs as being the only significant factor and this is not in the best interest of good design.

That was the point I was trying to make. Therefore, anything that can be done to encourage a real evaluation in terms of the effect on the design of the community. So that initial costs may be higher for the construction because of providing amenities that have a long range and significant effect on the community, or anything that can be done to take this more into consideration at the time that the decisions are being made, would be very helpful to creating a better environment.

Mr. CULVER. I agree totally with what you say. I just want to cite an example. In FHA's guidelines, they specify in low-income housing that you can't own a washing machine.

Now, a woman could have six or eight kids and it could be economically sound in the long run to buy a washing machine. Those kinds of issues can be brought up in instance after instance.

Mr. Sowers. Mr. Allen spoke about the dollar value on the esthetics on the building with regard to our environment. The consulting engineer is told by his client, which oftentimes is a Government agency, that he meet the minimum codes on pollution, waste, and air pollution—the solid wastes and the air pollution—so it comes back to spending the minimum of dollars to come within the codes and ordinances or regulations that we have to work with which I feel is not always the best thing for our environment.

Mr. Hansen. But ignores, very often, other costs to the community which are actual costs that should be taken into account.

Mr. Pratt. I would like to add a comment to that, using another example, not just a building but a piece of the city, which must be a very typical one in this country; that is, the gradual erosion of our natural resources and drainage waste within our urban communities where very often we spend large sums of money to put these into concrete channels or put them under the ground entirely in order to acquire more land for building purposes.

We often create flood problems for ourselves as a result of this. This is a substantial public issue in Dallas where a creek in the north portion of that city has been studied and the engineers have reported that it is the same cost to either build a concrete channel or to buy up 56 homes, up to the 100-year flood level established by previous experience.

So this issue becomes purely a political issue, a space-saving issue, rather than a dollar issue within the public community and it resides within the purview of education to provide the answer.

Mr. Brademas. I have just one other question, gentlemen. I was much impressed, Mr. Allen, by your statement on the need for a multidisciplinary approach if it were to be effected in this area. This is also the approach represented, as you know, by the report of Dr. Steinhart.

How difficult will it be to get architects to agree to cooperate with nonarchitects in this respect?

Mr. Allen. I can say without reservation that it won't be difficult at all. The architectural profession does feel that the multidisciplinary approach is a very valid one. We have traditionally worked with many other disciplines in executing the more traditional kind of project that we have had in the past and we have become more and more aware recently of the need to expand the number of disciplines that we work with.

We don't necessarily mean, either, that we have to be the top dog. We can work as part of a team where someone else leads as well as being the ones who have the initiative. I think that depends entirely on the project.

Mr. Brademas. Is the new environmental program that I see, Mr. Culver, is underway at Howard going to reflect this multidisciplinary attitude?

Mr. Culver. I am not aware of that. I am not involved in that particular program. I cannot say as a fact.

Mr. Brademas. Thank you very much.

Mr. Sowers?

Mr. Sowers. I would like to support Mr. Allen's statement in the cooperation between the disciplines. The American Institute of Architects has recently, I think, had some concerted efforts in that direction. They have invited the Consulting Engineers' Council, and disciplines in other fields that have to do with our environment, and are making great strides in that area. We are still studying how these disciplines can work together.

I have served with this committee and we have prepared a paper that has filtered down to the grassroots level of our members, to encourage collaboration at the local level of all the disciplines.

Mr. **Culver.** In the use of the word "discipline," I would like one of the disciplines to be named the user. I don't want us to get hung up in thinking disciplines are all professionals.

Mr. **Allen.** I would add to Mr. Sower's statement that some years ago we established a council, the Inter-Professional Council on Environmental Design, ICED, which includes the presidents of six organizations: The American Institute of Architects, the American Association of Landscape Architects, the American Institute of Planners, the Consulting Engineers Council, the National Professional Engineers Society, and the American Institute of Civil Engineers.

In addition to this, we had, last December, I think the 17th of December, a consortium at the American Institute of Architects headquarters, where all these disciplines, plus representatives of the Government and the National Educational Association and many others, were invited to participate in the discussion on education for environmental awareness.

Mr. **Brademas.** Thank you very much, gentlemen.

Before I call on Mr. Sowers to present his statement, I would like to welcome to the subcommittee hearings here this morning persons who are participating in the 21st annual seminar on "How Our Government Operates," a seminar which is sponsored by the Textile Workers Union, and the people who are with us here today are all workers in the textile mills in the United States and are here under the leadership of William Duchessi, the legislative director of the TWU, and we are very pleased to have you all here observing our discussions this morning of the Environmental Educational Act.

Mr. Sowers would you like to go ahead?

STATEMENT OF WILLIAM SOWERS, PRESIDENT-ELECT, CONSULTING ENGINEERS COUNCIL

Mr. **Sowers.** Yes.

Mr. Chairman and members of the committee, it seems appropriate to me, in view of the time we have taken, if I would skip reading all of my prepared text. We are here today on behalf of the Consulting Engineers Council in the United States. The council is an organization approximately 15 years old. We now have 2,300 engineering firms in private practice throughout the country.

We wholeheartedly support this bill. We in the council are always eager to learn about anything that has to do with our environment and wish to offer assistance in any of these areas where we think that the efforts are to the benefit of mankind.

In the prepared text that I have you will find that there are some recommendations concerning this bill. I would like to review those. One recommendation is that the program should include a resource director for existing programs and activities having to do with our environment and a roster of organizations or individuals throughout the country who are equipped to carry out these programs and projects that might be provided under the act.

A second recommendation is that the bill states that the Advisory Committee consist of educators, editors, sociologists, and others. We think perhaps it could be more specific in naming such groups as the architects, engineers, other people in science, and agriculture.

Another recommendation is that the Advisory Committee could probably function better if it had a more direct relationship with the Commissioner of Education rather than reporting to the Secretary of HEW.

Finally, we noted that there is no price tag accompanying this bill. In consultation with other organizations such as AIA and in reviewing past Federal programs similar to this, we think that it might be in order to start with a budget of perhaps $2 or $3 million the first year, and maybe the following year, it could be in the order of $10 million, which is a figure that has been suggested for other similar bills.

Mr. Chairman, unless there are other areas of this prepared statement that you would like for me to discuss at this time, I would like to ask that the statement be placed in the record.

Mr. BRADEMAS. Thank you very much. Mr. Sowers, without objection the entire text of your statement will be included in the record as if read.

(The statement follows:)

WILLIAM A. SOWERS' STATEMENT IN BEHALF OF CONSULTING ENGINEERS COUNCIL/USA

Mr. Chairman and Members of the Subcommittee, the Consulting Engineers Council of the U.S. is pleased to note the interest of the Congress in developing a greater public awareness and understanding of the need for protecting this nation's environment. We appear here today to share with you some of our concerns and to join with the American Institute of Architects in support of the concept of a Federal program to enhance environmental education at all levels.

My name is William A. Sowers. I am a partner in the consulting engineering firm of Sowers, Rodes and Whitescarver in Roanoke, Virginia. My firm specializes in mechanical, electrical and structural engineering for industrial, commercial and institutional buildings, including hospitals, schools and public housing.

My presence at this hearing, however, is in connection with my capacity as President-elect of the Consulting Engineers Council of the United States, a not-for-profit organization of approximately 2,300 private practice engineering firms. Consulting engineers are in the forefront of environmental design. For example, typical projects handled by our members include: The Lake Tahoe Water Purification Plant, Sitka Dam in Alaska, the Hempstead, New York, 600-ton incineration plant, the Dallas-Ft. Worth Regional Airport and Shea Stadium.

For the most part, however, the average consulting engineer is concerned with slightly smaller, less noteworthy projects involving street lighting, sewer systems, air conditioning of buildings, recreational development, site planning and similar public works. It is in this capacity as consultants to communities, industries and government—that our members have long been aware of America's mounting environmental pollution problems. Consulting engineers were, in fact, among the first to warn of the dangers of thermal pollution from atomic power plants, and for centuries engineers have pointed out the importance of adequate water treatment, as compared to proliferation of outhouses or septic systems.

What has truly brought the environmental engineering issue into focus today is the fact that man's ability to create adverse effects has reached the point where it occasionally exceeds his ability to perceive, judge, prevent or control them. As a result of an apparent insatiable desire for convenience and comfort, man is finding that he is producing situations in both his natural and man-made environments which he can neither tolerate nor control, and which are often irreversible.

Examples of what can happen, such as the eye-smarting Los Angeles smog, or the impending death of Lake Erie, are all too familiar to us. These events, and many more, dictate that the U.S. immediately undertake a concerted program to promote environmental quality and, at the same time, plan for and protect various personal and political values for the 100 million additional citizens which are projected for this nation in the next thirty years.

Certainly much can be done through massive local, state and national public works-type programs and we are certain to see some improvements by virtue of stricter government controls as well as by means of the threat of legal punishment. In the engineers' opinion, however, successful efforts to conserve our natural resources and more effectively manage the environment will depend in large measure upon the ability of the people to understand, and to cope with, the related complex technical and social problems, as well as to develop and implement programs for the distribution of information on a broad scale. In short, America (in fact, the world) needs to maintain and expand its current "environmental consciousness" through broad educational programs in the schools, and more generally, through an adult education program for the public as a whole. We believe that H.R. 14753, and related bills, represent a first step toward this goal.

We feel obligated, however, to point out that our support of this measure involves selfish as well as altruistic objectives. A recent poll of our Consulting Engineers Council member firms revealed that the major problem confronting our profession is a critical shortage of trained and qualified technical personnel. What is particularly alarming is the fact that this shortage shows every indication of becoming more pronounced in the years ahead due to the steadily declining enrollment of prospective engineers in the various universities and colleges. While figures for the present year are not yet available, the percentage of all freshmen enrolling in an engineer curriculum dropped from 23.3% in 1957 to less than 10% in 1969. The actual number of junior and senior engineering students dropped from 106,141 in 1968 to just over 96,000 this year.

Other than the long-standing complaint that engineering is an extremely tough subject, the major cause of this reduction has been the deglamorization of engineering and the growing attraction of science to young men and women with engineering inclinations. The allure of the Apollo moon program, for example, is considerably greater than the "prestige" of designing a sewer treatment plant.

We believe that an increased educational emphasis upon imaginative new programs in environmental science will almost certainly spark an enthusiastic response from students at all levels. It only stands to reason that increased exposure to such issues, plus public recognition of the importance of finding solutions to environmental problems of an applied nature, will most certainly result in the attraction of more and better students, ***and faculty***, to this type of work. That can only result in more people looking to careers in environmental engineering.

Consulting engineers have already been stirred to action by the need to attract more students to our profession. Several of our chapters sponsor summer intern programs to acquaint high school students with the important services being rendered by engineers. In New York State, members of our Council invite Cub Scout groups and elementary school classes to visit their firms to learn what we do, and why we do it. These students go to actual job sites and see first-hand the importance of proper drainage to prevent soil erosion, or the value of designing a pumping station to look like a private home in order to maintain a residential continuity in the neighborhood.

In Colorado, Oregon, Illinois, and Iowa, consulting engineers are available as guest lecturers at local high schools and colleges, and in Minnesota, consulting engineers have produced a series of half-hour television shows to explain the environmental problems with which they deal.

While programs such as these barely scratch the surface of what our profession could, or should, be doing in the way of helping define public need and opinion, they are sufficient to prompt us to suggest that a tabulation of talent and information resources would constitute a valuable addition to the provisions of H.R. 14753. Such a compendium could be compiled under the direction of the Commissioner of Education as an addition to Section 3 of the bill, or by the Advisory Committee on Environmental Quality Education, as described in Section 5 of the bill.

The advantages and benefits of a resource directory of existing programs and activities, and of qualified environmental experts, is self evident. At little or nothing in the way of Federal expense, the Commissioner of Education would have at his disposal a roster of organizations and/or persons whose talents and experience could be utilized in connection with projects approved under the Environmental Quality Education Act. Consulting engineers (and I am sure that architects, conservationists, botonists, and others) would be pleased to make themselves available at no charge, other than expenses, for "teach ins", guest lectures, seminars or similar environmental education program-related activities.

In this connection, Section 5(b) of the Bill, describing the constituency of the 21-member Advisory Committee, appears to us to emphasize selection and appointment of educators, editors and sociologists as committee members. We would like to suggest that this Section be reworded to encourage appointment of individuals experienced and knowledgeable with the various fields of ecological and environmental science, including persons familiar with education, information media, conservation, architecture, engineering, science, agriculture and similar fields. In some respects the present criteria, while broad, could mean the automatic elimination of certain key professions from participation in this important public body. As an example, in discussing the consulting engineers' interest in environmental education with a member of this Subcommittee's staff, it was necessary to explain what relation the consultant had to the subject of environment.

The Advisory Committee is, incidentally, required to advise the Secretary of Health, Education and Welfare, while actual administration of programs under this bill is made the responsibility of the Commissioner of Education. It would seem appropriate to have a direct relationship between the Advisory Committee and the Commissioner, rather than with the Secretary.

While we realize that authorization of a specific dollar amount has purposely been omitted from the initial draft of H.R. 14753, it is assumed that comments along these lines would be welcome. We note that other bills on this subject—specifically S. 3237—suggest a beginning authorization of $10 million for an environmental education program. Our Council believes that a more practical approach, in the light of delays experienced on several other vital programs authorized by Congress in recent years, would be to approve a relatively smaller first-year authorization of between $2 or $3 million which would adequately finance the organization and "tooling up" for the program. Included in this amount should be both funds and authority for the environmental education information resource analysis mentioned earlier in this testimony.

In limiting the first-year appropriation to not more than $3 million, Congress should, of course, commit itself to a subsequent year authorization of $10 to $12 million for conduct of the various programs set forth in the Environmental Quality Education Act. Perhaps this could be added to the bill.

H.R. 14753 sets for itself a formidable goal. There are approximately 50 million children in the nation's elementary schools and junior and senior high schools. Many now complete their secondary education without ever having been specifically alerted to the values of the environment and the potential dangers it faces.

Fortunately a few programs of a science-education nature have been implemented in recent years, some as early as 1950, and it is possible that these may be partially responsible for the public's current growing awareness of the pollution, population, and land reclamation crisis.

As is well known, today's students are deeply troubled with the state of the world and they are, for the most part, sincerely anxious to do something about it. The programs suggested in the Environmental Quality Education Act should serve both to stimulate added interest and to provide a constructive channel for the younger generation's energy and idealism. We feel sure our nation would profit far more from a "plant in" of shrubs and trees than it would from a "freak out" from pot and sex.

The real challenge lies in enhancing the general education of the adult public. Several avenues of approach must be developed and implemented, including exhibits, demonstration projects, encouragement of popular magazine articles (written by experts and not by uninformed alarmists), quality television shows and movies, adult education programs by institutions and private groups, and encouragement of more and better public discussion groups and forums.

The League of Women Voters, Parent-Teacher Associations and conservation groups have already made substantial strides in this area. Our own Consulting Engineers Council is inaugurating several programs related to adult education ranging from the establishment of engineers' speakers bureaus in at least half the states, to sponsorship of public-interest forums on specific subjects.

An outstanding example of the latter was an all-day meeting held February 24 in Seattle, Washington, in which consulting engineers from that state sought to clear the air regarding design, location and projected impact of Interstate 90 on the City of Seattle. More than 300 people turned out to hear experts on both sides discuss tunnels versus cut overs, multiple use versus air rights, aesthetics and acoustics, and projected community development, both with and without the new highway. Architects, educators, editors, attorneys, planners, wildlife experts, and city officials joined with engineers in bringing the I–90 project into focus.

Most consulting engineers willingly accept the premise that our profession has an inescapable responsibility for providing leadership for our swift changing technological world. Engineers have taken justifiable pride in their creations which, despite consumption of many of our resources, have eliminated the dust bowls and flash floods of the 20's and 30's, cooled our homes and offices in the hot summer, and brought the comforts of electricity and running water to rural America.

Often a consulting engineer's complaint that an airport extension might drive away wildlife, or that dumping of waste in a river could make the water unusable to those living downstream, fell on the deaf ears of government agency personnel whose *primary concern was with first cost. One San Mateo, California*, engineer who objected to the location of an interstate highway in an urban area, rather than in a more scenic and remote section (the latter at more cost), was faced with the ultimatum of either getting on with it, or getting out. In choosing the latter alternative, he became the exception rather than the rule, for there is little return on standing up for one's convictions in the face of government pressure.

Today, awareness of the environmental situation is slowly changing. Environment, conservation and ecological protection are "in"; expediency at all costs is out. Tomorrow, historians, educators, doctors, bakers, and even Indian chiefs will, as a result of this legislation, bring preservation of our environment to front stage center. We feel it is attention which is long overdue and we are pleased to lend our support to this important measure.

We thank you for the opportunity to appear here today.

Mr. BRADEMAS. Let me say I think it is a first-class statement and I am especially impressed on the second page of your statement at the eloquence with which you say:

> As a result of an apparent insatiable desire for convenience and comfort, man is finding he is producing situations in both his natural and manmade environments which he can neither tolerate nor control, and which are often irreversible.

May I put to you, Mr. Sowers, the same kind of question that I put to Mr. Allen and his architectural colleagues.

To what extent does engineering education in the United States today provide training and education and concern about the whole spectrum of environmental issues?

Mr. SOWERS. To my personal knowledge this effort in our universities is very limited. As a matter of fact, we, in our council, know of many colleges and universities where even one engineering department does not have a proper relation with another engineering department.

They don't speak to each other. They are jealous of their own little nitch. This also is true between the school of architecture and other schools in universities having to do with and learning about our environment.

Mr. BRADEMAS. What you have so gently observed there may be the explanation for a lot of the evils inflicted on the American eye. If the engineers can't even talk to the engineers, then we laymen are really left with the short end of the stick.

Mr. Sowers. I think, as Mr. Allen pointed out and as I mentioned just a little earlier, this is being corrected among the architects and engineers in this country. We have made great strides in the past 2 years.

Mr. Brademas. I am very encouraged to see that. I would observe, as a layman, that we don't have to wait too long for this kind of revolution in education for the engineers and architects. If we have to wait a generation for all of you, then it is going to be enormously difficult for the rest of us in society to catch up.

You have got to be the pipers, the engineers and architects. Are you moving ahead rapidly enough or are you simply hitting this issue a lick and a whistle, and, in effect, making only a sort of symbolic bow in the direction of the environmental issues.

Mr. Sowers. I think we are gaining headway and I think we are gaining it very rapidly. I might relate to you a visit I had with the Nevada Association of Counsulting Engineers just 2 weeks ago. I spoke to them about this very subject. They admitted that they have not had the proper relationship with the American Institute of Architects in that State and they are taking immediate steps to do this.

The other reason I mention this visit is that I asked these engineers what they thought was the No. 1 priority for the Consulting Engineers Council in the immediate years to come and they said: Environment, ecology, pollution, whatever you want to call it; there is nothing else left.

Mr. Brademas. I may be simply repeating some of the questions we have been discussing here, but it does seem to me that engineers who wish to regard themselves as a profession don't want to find themselves in the trap of being simply regarded as technicians—not that there is anything ignominious about being a technician, because that is another question I want to ask you about—but the idea of a profession has always seemed to me to be one which suggests that there is some sort of broad or philosophic context within which a man views what it is he is about. I am much encouraged about what you have said, about what the engineers are doing within their own profession to stimulate interest in the environment and, second, about what you say about the cooperation with the architects and those in other professions.

I would hope that if we were to meet 5 years from now, that a genuine revolution would have taken place, both in architectural and engineering education in the United States with respect to the issue we are discussing here today.

I have just two other quick questions.

I understand that there is some difficulty in the United States in attracting young people into the engineering profession. Is that any longer the case?

Mr. Sowers. That is quite true and we think that it is because of the glamour that is often associated with space agency projects. I can speak for my own firm. Some of the finest young engineers that we get are not those that are graduates straight out of college. We have a very difficult time getting them. Perhaps we can't compete, pricewise, with industry and some of the space programs in paying the salaries that are offered these young men. Even if we could, we still would have a problem getting them. Some of our best people are people who have been in industry and in the space agency for 2 or 3 years and have then decided that this was not their niche in life.

The would like to come back into the consulting field.

Mr. BRADEMAS. That last phrase you used is the one I was getting at. One reason people don't go into engineering as a career is that they view engineering today as without much excitement, without much relationship to ideas, to what the really great issues facing our country are.

Mr. SOWERS. As we understand the bill, we feel that this will help to enhance our profession, and entice young men into it.

Mr. BRADEMAS. Thank you very much.

Mr. ALLEN. I just wanted to take this opportunity to ask Mr. Sower if he would agree that there is a real need to develop, in the educational institutions, the higher educational institutions, more courses that would direct engineers toward the building construction area, particularly in mechanical and electrical work. It seems to me that the great majority of engineers working in these fields are ones who have come to it sort of by accident and not by training. Is this true?

Mr. SOWERS. This is quite true and especially in the electrical engineering field, to find a man who has been properly trained to handle the lighting and power aspects of a building construction project. It is very difficult to find a man coming out of college today with this type of training.

Mr. BRADEMAS. The gentleman from New York, the distinguished member of this subcommittee and sponsor of this legislation. You may be interested to know he has been the principal champion in Congress in insisting that any bills we authorize to the construction of facilities should be accompanied by 1-percent set-aside to be used for insuring attention to making the buildings esthetically attractive.

I fear that the legislation authorizing the legislation of the Rayburn Building was passed before he came to Congress.

Mr. SCHEUER. I thoroughly enjoyed the testimony. It will give us a great deal to think about. I had experience before coming to Congress as a developer of large-scale housing projects and often when the architect wanted good architecture and planning, the engineers would argue successfully that it had to be done another way because it was cheaper.

In the past the engineers' comparative lack of interest in and concern for esthetics has hurt the architects—and I don't wish to exculpate the architecture fraternity for they have not had as much concern as they should have had. Yet, I wonder whether it wouldn't be a good idea for engineers to have some training and experience in providing alternative courses of action for a particular engineering problem which would measure the environmental fallout of constructing sewers or roads or powerlines in one way rather than another.

Frequently they will say, if you do it differently it will cost *x* dollars more. They are not really thinking of esthetics as a valuable factor in making the decision. They don't consider the environment tradeoff as a plus. Do you think we can inculcate any rigorous discipline in cost-benefit evaluation of environmental factors in the engineering as well as the architectural schools?

Mr. ALLEN. I certainly hope we would and I don't think that esthetics is something that the architect has sole right over. I think that anyone doing any kind of design should be concerned about esthetics, the engineers as much as the architects.

My distinction between an architect and engineer is not at all based on whether one is responsive to esthetic problems or not. I think it has been too true that the engineering profession has been less responsive to esthetic questions. I would hope that it is becoming less true, because I don't think that anyone who does any design disassociates themselves from the way the design looks and, therefore, the effect on the people who look at it.

Esthetics is not something you add on, but should be an integral part of the design process and, if it isn't, then it has very little value. If it is just declaration, it is very insignificant in its use and in the long-term cost benefit of the project.

I agree that the architects have been equally guilty in not being sufficiently concerned about cost benefits so they could, in fact, sell their ideas more effectively. I think this is an essential part of the process of design. Any distinction between the two professions is that the architect is primarily concerned about the spaces that people use, at all scales from a single room to a whole city, whereas the engineer is primarily concerned with the way in which the spaces are created, the various systems that go in to creating the space.

There are some people who are both good architects and engineers. But generally speaking, these disciplines are separated because of the difficulty in emphasis.

Mr. Sowers. I am personally somewhat of a crossbreed. I received my first college degree in a school of engineering and the second in a school of architecture and practiced engineering for 23 years.

In my particular firm, we are primarily engaged in the design of the mechanical and electrical facilities for building projects and it is a constant battle for me to educate young engineers on the esthetic quality of the structure. Some simple things that could be illustrated: for example, the thermostat on the wall behind you might just work as well if it were 2 feet lower and I wouldn't even see it.

I think there should be some type of program in this area to educate the engineers on the esthetic qualities of our environment.

Mr. Culver. Even though I think it is important to educate architects and engineers, I think it is more important to educate the public. I feel it is the public's pressure on the engineer or architect that made him responsive to economic considerations.

I don't blame architects and engineers.

Mr. Scheuer. Mr. Culver, how do you educate—you are talking about educating the public—a slum child into a concession for the environment, a child who, living in a degrading, dehumanizing environment, passes daily through rubble-strewn streets.

He goes to schools that, more often than not, are old and dilapidated. In my district we still have Abraham Lincoln era schools. How do you create a sense of awareness in the beauty of life?

Mr. Culver. I am not quite sure. I know what can take place, and has been taking place, is exposure; how we could get him to receive this information and use it. I know this must take place.

When we speak of children in slum neighborhoods, we still recognize the percentage of televisions in the homes irrespective of the economic level. It seems to me that this highly significant technical instrument could be used in a way that we could be bringing this in to educate in the home.

It can't only take place in schools, even if the school is the best vehicle. It just seems that 6 hours you spend in school is not enough. When we speak of the middle-class white person going to a hip school, he also has his home environment to deal with. He has this grass phenomena and the trees and a decent house and these kinds of things.

So I think we would have to search for very highly significant technical instruments. I don't think that if we only try to educate that child about his environment, that he can do something about it. We will have to do something about the environment sooner or later.

I think we have to go along a two-pronged trail.

Mr. SCHEUER. Thank you very much.

Mr. BRADEMAS. Thank you all very much indeed. This has been extremely helpful testimony and we appreciate it.

Our final witness this morning is Carl J. Megel, the legislative director of the American Federation of Teachers. Mr. Megel, we are very pleased to have you here this morning. Please go right ahead.

STATEMENT OF CARL J. MEGEL, LEGISLATIVE DIRECTOR, AMERICAN FEDERATION OF TEACHERS, AFL-CIO

Mr. MEGEL. Mr. Chairman and members of the committee, my name is Carl J. Megel. I am the legislative representative of the American Federation of Teachers, a national teachers union of more than 200,000 classroom teachers affiliated with the AFL-CIO.

I am appearing before this committee in support of H.R. 14753, a bill cited as the "Environmental Quality Education Act." For decades our society has maintained that "man is a creature of his environment." It was convenient to use this cliche to absolve unconventional acts against excessive abuses of our natural resources.

Our expanding and concentrated society became accustomed to our environment in which garbage lined its streets; automotive exhausts, smoking factories, and rubbish decay fouled and poisoned our air; sewerage and industrial waste putrefied streams, killing fish and plant life as well as contaminating the water beyond useful human uses.

It is, therefore, encouraging that public concern has suddenly turned the spotlight upon these corruptions and reversed the traditional cliche by now espousing the principle that "environment is the creature of man's neglect."

My grandfathers, who settled in southern Indiana in the early part of the 19th century, found virgin trees, untouched by human hands for thousands of years, as the great obstacle to their agricultural progress. Upon invitation, dozens of neighbors were invited to a "log rolling." The finest logs—oak, beech, ash, gum, and poplar—invaluable today, but worthless in another age, were stacked and burned.

The resultant scarcity of lumber to build an ever-growing society produced lumber and sawmill profiteers a short few years later. Their devastation is in evidence to this very day in northern Michigan, in Wisconsin, and in the great redwood areas of the Northwest.

Gordon R. Conway of the Malaysia Agricultural Research Center points out another significant problem that arises as a consequence of of the use of insecticides. He points out the danger of destroying the balance of nature. In Malaysia, young cocoa saplings were planted after sturdy forests were cut down. The conventional pesticides killed off traditional insect pests. However, in so doing, the new tender cocoa sprouts immediately became the object for an invasion of new and hitherto unknown insect pests.

A more complete documentation of information on water, air, noise, and pesticide pollution is reproduced in the following pages from an article entitled "Eco-Facts," published in the April issue of the American Teacher, official publication of the American Federation of Teachers, David Elsila, editor.

I will not read these facts to you. I want to ask that they be inserted in the record as I have reproduced them here.

Mr. Brademas. Without objection, it is so ordered.

(Article "Eco-Facts" follows:)

Eco-Facts

WATER POLLUTION

Eutrophication is a process whereby nutrients (nitrates and phosphates) are added to the water in bodies of water, causing multiplication of algae and small bacterial plants, which, due to their numbers, die in huge quantities, and exhaust the oxygen supply in decomposition. The water's oxygen is depleted to the extent that all other forms of life are "choked" to death.

Phosphates—are nutrients found in many detergents in the following concentrations:

Axion (Colgate Palmolive) 43%.
Biz (Procter & Gamble) 40.4%
Bio-Ad (Colgate) 35.5%
Salvo (Proc & Gam) 30.7%
Oxydol (Proc & Gam) 30.7%
Tide (Proc & Gam) 30.6%
Bold (Proc & Gam) 30.2%
Ajax Laundry (Colgate) 25.2%
Punch (Colgate) 25.8%
Drive (Lever) 25.3%
Dreft (Proc & Gam) 24.5%
Gain (Proc & Gam) 23.1%
Duz (Proc & Gam) 23.1%
Bonus (Proc & Gam) 22.3%
Breeze (Lever) 22.2%
Cheer (Proc & Gam) 22.0%
Fab (Colgate) 21.5%
Cold Powder (Colgate) 19.9%
Cold Water All (Lever) 8.8%
Wisk (Lever) 7.6%
Diaper Pure (Boyle) 5.0%
Trend (Purex) 1.4%

(A low-phospate product, some say, does not get clothes clean. The answer is to add a "water softener" to the wash, and performance is good.)

Fish—Over 15 million fish died last year from water pollution. Senator Edmund Muskie, 12/10/69.

Eutrophication—Very recently the soak and detergent industry contended that because it is not the only cause of lake eutrophication, it should not be asked to find substitutes for phosphates in its detergents. (Senator Edmund Muskie, 1/15/70).

AIR POLLUTION

Cancer—It has been generally concluded that air pollution is one of the factors contributing to the steady increase of lung cancer. (Citizen's Committee for Clean Air, New York City Council, Robert A. Low, Chairman)

Smoking—A person breathing New York City's air inhales as much benzopyrene, a cancer-inducing hydrocarbon, as he would if he smoked two packs of cigarettes a day. (Robert A. Low)

General—According to the U.S. Public Health Service, any community with a population of 50,000 or more, has a real problem with air pollution.

General—The effects of air pollution are directly experienced by the more than half of our population living in our great widespread urban-suburban complexes. (Vernon G. MacKenzie, Chief, Division of Air Pollution of the U.S. Dept. of Health, Education and Welfare)

Cancer—According to the U.S. Public Health Service, skin cancer that developed on a mouse after its skin was painted with pollutants from urban air, was probably caused by those pollutants.

Trees—Early in this century, fumes from smelting operations in the Ducktown-Copper Hill area of Southeastern Tennessee virtually denuded 17,000 acres (27 sq. miles) of forest land and severely damaged another 30,000 acres. Much of the area, bare and eroded still, has been likened by a recent observer to "the back of the Moon." (Richard D. Pardo, American Forestry Association, 2/12/70)

Trees—During the summer of 1969, Christmas tree plantations along the Maryland-West Virginia border suffered heavy foliage damage. Plant scientists are convinced that air pollution was the cause and a nearby power-generating station was the source of the trouble. (Richard D. Pardo, American Forestry Association, 2/12/70)

Breathing—Each breath you take carries some 40,000 particles of dust if you are surrounded by "clean" country air, some 70,000 if you live in the city. Then come the noxious gases. The nation's cars daily release: 250,000 tons of carbon monoxide, 16,500 to 33,000 tons of hydrocarbons, and 4,000 to 12,000 tons of nitrogen oxides. (Redbook Magazine, August, 1966)

Industry—The burning of coal for heat and power sends 48,000 tons of sulphur dioxide into the air every day. (Redbook Magazine, August, 1966)

Cars—The automobile is the primary villian in air pollution. It accounts for at least 60% of the total air pollution in the United States—85% of the pollution in some of our sprawling urban areas. ("Air Pollution—Present and Future," City of Livermore Air Pollution Control Study Committee, March, 1968)

Cars—In the United States, the automobile produces 90 percent of all carbon monoxide pollution. (The Automobile and Air Pollution: A Program for Progress (Part II), U.S. Dept., of Commerce, December, 1967)

NOISE

Decibel levels—the following are averages:

shouts—90
normal conversation—50-60
whisper—20
motorcycle—110
riveting gun—130
thunderclap—120
jet—117

Health—It has been shown in animal studies, however, that rats born of mothers exposed to noise pollution during pregnancy had more difficulty in learning maze patterns than rats born of un-stressed mothers. (New York Times, 12/28/69)

Health—Well-informed scientists reckon that if city noise continues to rise as it is presently rising, by one decibel a year, everyone will be stone deaf by the year 2000. (New York Times, 11/23/69)

Health—Rats, under prolonged noise exposure, have turned homosexual. (New York Times Magazine, 11/23/69)

Costs—Silence seems to cost something between 5 and 10 percent more on most products. (New York Times, 11/23/69)

Health—Dr. D. Glass (NYU) and Dr. J. Singer (SUNY) have shown that repeated random and unpredictable noises produce irritation and frustration, as well as dramatic declines in work efficiency even after the noise is stopped. Their studies disproved the popular assumption that man can learn to adjust to almost any noise. (New York Times, 9/11/68)

PESTICIDES/HERBICIDES

General—"Elimination of the use of persistent toxic pesticides should be the goal. (President's Science Advisory Committee Report, 1963)

Definition—Persistent, toxic pesticides include the following: DDT, Aldrin, Endrin, Heptachlor, Texaphene, Chlordane, Lindane, Benzene, Hexachloride, Dieldrin, and there are those chlorinated hydrocarbons that do not break down completely in a few days or even a few years into less harmful materials. Of pesticides all are not persistent. All, however, are questionable.

Wildlife—It has been discovered that many forms of wildlife—brown pelicans, peregrine falcons, and bald eagles, to name a few—(1) have large quantities of DDT in their systems and eggs, and (2) are, in some areas, no longer capable of reproducing. (Sunset Magazine, August, 1969)

DDT—is an active product in over 35 products. (Sunset Magazine, Aug. 1969)

DDT—Evidence of severe oceanic contamination is the fact that some seabirds which never approach land except to nest are sometimes more contaminated with DDT than land birds.

Sea Creatures—Some organisms are unbelievably sensitive to the chlorinated hydrocarbons. For instance, nearly half the population of brine shrimp is killed within three weeks at a concentration of one part per trillion DDT, or 1/1000 of a drop in a tank-car lot. Temperature-control mechanisms are upset in young salmon at a few parts per billion, and death in a natural competitive environment could easily be the result.

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RECYCLING

Natural processes are a system of cycles. All things are a part of this system. When man takes natural resources to produce things, he often interrupts a cycle. The idea behind recycling is to channel an item, once used, back into the system, thereby recycling it.

Our objective is to begin to treat garbage and trash with due respect. Reduce the amount of waste you produce by considering what will happen to each thing you purchase. Packaging will play an important role here. Things like cellophane, waxed paper, styrofoam, and plastics are not bio-degradable, or easily recyclable, and should be avoided. Try and recycle all things you do not need.

Mr. MEGEL. We concur and support the objectives of H.R. 14753 to emphasize the environmental needs through education. A man living on a deserted island could commit no crime or felony except suicide. It would be unlikely and perhaps impossible for him to pollute the air, the land or the water to such an extent as to become detrimental to himself. The addition of only one person and all the conditions immediately change.

Our forefathers came to this great land so lavish and abundant in natural and mineral resources as to impart an impression of inexhaustible supply. In sanctifying the free enterprise system, we erred greatly in giving full rein to its polluting proliferation.

I mentioned the forest devastation. Notice the oceans of foul chemicals and detergents, the slag, and the sludge which our factories daily dump into our lakes and streams; the air pollution and smog caused by the exhaust pumped into the air by our millions of automobiles and the soot and smoke of our thousands of factories. Unless some of these can be corrected, education alone will have little value.

Section 3, article 3 provides for whatever grants are appropriated to "institutions of higher education" and so forth. We believe that greater emphasis should be placed upon instructions in secondary education. We support the program outlined for high schools by the environmental action clearinghouse which proposes 10 projects listed below:

1. Organize participatory debates and speaker discussions; invite local polluters to explain their policies.
2. Develop a "pollution trackdown" for students to locate local polluters.
3. Establish an environmental curriculum.
4. Create an environmental fair with films, photographic displays, and exhibits of polluted water, dead fish, and so forth.
5. Build an environmental center downtown to involve citizens in discussion of ecological problems.
6. Distribute buttons, bumper stickers and posters.
7. Coordinate letterwriting campaigns to private industry and legislators.
8. Hold mass phone-ins to industrial polluters.
9. Encourage science projects on environmental problems.
10. Request the PTA to support antipollution drives.

Barry Commoner, director of the Center for Biology of Natural Science, in his article "Frail Reeds in a Harsh World" states it well when he says:

> The lesson taught by the environmental consequences of modern technology, both in the advanced and underdeveloped nations, is the same: We need to reassess our attitudes toward the natural world on which our technology intrudes.
>
> Among primitive people, man is seen as a dependent part of nature: a frail reed in a harsh world, governed by immutable processes that must be obeyed if he is to survive. The knowledge of nature that can be achieved among primitive peoples is remarkable. The African Bushman lives in one of the most stringent habitats on earth—food is scarce, water even more so, and extremes of weather come rapidly. The Bushman survives because he has an incredibly intimate understanding of his environment. A Bushman can, for example, return after many months and miles of travel to find a single underground tuber, noted in his previous travels when he needs it for his water supply.
>
> We who call ourselves advanced claim to have escaped from this kind of dependence on the environment. Where the Bushman must squeeze water from a searched-out tuber, we get ours by the turn of a tap. Instead of trackless wastes, we have the grid of city streets; instead of seeking the sun's heat when we need it, of shunning it when it is too strong, we warm ourselves and cool ourselves with man-made machines. All this tends to foster the idea that we have made our own environment and no longer depend on the one provided by nature. In the eager search for the benefits of modern science and technology, we have been enticed into a nearly fatal illusion: that we have at last escaped from the dependence of man on the balance of nature.
>
> The truth is tragically different. We have become not less, but more dependent on the balance of nature. Modern technology has so strained the web of processes in the living environment at its most vulnerable points that there is little leeway left in the system. Unless we begin to match our technological power with a deeper understanding of the balance of nature, we run the risk of destroying this planet as a suitable place for human habitation.

Now, since "the truth is tragically different," the committee is to be commended for proposing H.R. 14753. While we concur with its major objectives, we are convinced that section 9, which authorizes the appropriation of "such sums as Congress may deem necessary" is unrealistic. President Nixon called for $10 billion for clean water. Unfortunately, he did not commit the Federal Government to provide even a minor portion of this amount, thereby rendering the proposal exciting but visionary.

We believe that we cannot begin to solve the immense problems of our environment without committing many billions of dollars to the project.

We wish to point out one other area of concern. Realizing the importance of concentrated effort upon "man and his environment," the project must not overshadow or reduce our efforts for improved housing, quality education, elimination of poverty, and all the other necessary social needs. This neglect of these services has contributed vastly to the unstable environment in which we live.

The American Federation of Teachers through its research director, Robert Bhaerman, commissioned Duane Kelly, a Kansas City, Mo., ecologist and public school teacher, to prepare an ecology lesson plan. The April issue of the American Teacher also carries this lesson plan in its special ecology section. We have reproduced the lesson plan for a supplement to my presentation and I ask also that it be inserted in the record.

That is on the pages following this presentation.

Again, may I compliment the committee for proposing H.R. 14753 and express my thanks and appreciation for the opportunity to appear in behalf of the American Federation of Teachers.

Mr. BRADEMAS. Thank you very much, Mr. Megel. We appreciate your testimony and, of course, the support of the American Federation of Teachers, because if we are to make any serious headway in improving the understanding of our environment, we certainly must work through the school system, at least in part, and this means a role for teachers.

Your document will go in the record at this point.

(The document follows:)

WILL WE SURVIVE?—A LESSON PLAN FOR SURVIVAL

INTRODUCTION

The effort has been made to build flexibility and options into the suggestions in this lesson plan since we realize it will be used from primary through collegiate levels and in a variety of courses. Please keep in mind these are only suggestions. Allow your imagination free play; add on, delete, revise, adjust, adapt, but do teach-in on Survival Day, 1970.

PURPOSES

To establish quality on a par with quantity in American life.

To develop a mood or feeling of respect for life—Albert Schweitzer's term for it was "Reverence for Life."

To consider the reordering of priorities.

To consider goals for this generation and future generations.

To arouse sufficient concern to move people to act toward the reordering of priorities and achieving long-range environmental goals.

SUGGESTIONS FOR ACHIEVING THE ABOVE PURPOSES

To be most effective, ideas and situations have to be personalized; each person has to realize that the quality of his life and his environment is at stake and that overpopulation is the Earth's No. 1 problem.

In any discussion, key vocabulary must be understood by everyone if progress is to be made and decisions reached. We suggest the following terms be clearly agreed upon before discussion starts:

Ecology
Progress
Human Being
Human habitat
Technology
Standard of living
Values
Priorities
Ethics
Population Explosion

BASICS—THE CONCEPT OF SPACE SHIP EARTH

There are four basic elements all life depends on: Sunlight, Soil, Water, Air.

The planet Earth is every bit as much a closed system as an Apollo space capsule; is is not, however, as clearly obvious.

Life on planet Earth has evolved over the past three billion years on the basis of cycling and recycling the available natural resources—matter and energy.

Man is creating a multitude of problems by breaking the cyclical patterns of the natural world.

The ultimate ecological/environmental problem is population—all other efforts will, in the end, fail if a zero population growth rate is not achieved.

BACKGROUND

One possible starting point is an environmental inventory keeping in mind the fundamental law of ecology: Everything relates to every other thing.

The inventory can be run on any scale from very small/simple up to any degree of complexity.

If the natural environment is obliterated—grass, trees, and wildlife displaced by concerete, asphalt, and people—find out what the original state was and compare the advantages and disadvantages of the changes.

POINTS TO BE KEPT IN MIND

The multiple effects of population on the environment.
The roles in today's society of technology, economics, and ethics.
The distinction between legal and ethical.

ACTIVITIES—CURRICULAR EXAMPLES

English—Write an essay on any of the following ideas:

Social Studies—Set up debates or panel discussions on a topic of your choosing, such as:

The Government should limit births.
We are now overpopulated.
How good vs. how big or how much.
Humanity vs. technology/machines/cars.
Mathematics—population equations.
History—Relate ecology and history.
Potato famine in Ireland.
Potato famine in Germany—WWI.
Erosion in Mesopotamia.
Destruction of habitat—ancient civilizations.
Biology—Review status of wildlife threatened with extinction.

Devise a state of the environment check list with rating system for the various components.

Fine Arts—Review works based on the natural world.

Discuss how these works would have turned out if the environment had been polluted—obliterated.

Samples:
Smetana's Moldau.
Beethoven's Symphony No. 6—The Pastoral.
Grofe's Grand Canyon Suite.

Foreign Languages—Analyze the environment—the impact of man since he became "civilized" in that land.

After class discussion—Set priorities and goals.

Act to make the society you live in a cleaner, more beautiful place to live.

POSSIBLE ACTIVITIES

Organize, plan, present an assembly
Organize, plan, carry out a:
  Poster campaign
  Letter campaign
  Phone call campaign
Plan radio, TV, press releases; possibly a series

Run chemical analysis on air and/or water with cooperation of federal, state, local laboratories

Set up plans including timetables to eliminate pollution, poverty, population growth, and hunger

Points to keep in mind: We cannot accept what we know is wrong—We cannot accept discouragement.

"We make things happen"

—HANK STRAM, *Football Coach,*
World Champion Kansas City Chiefs.

RESOURCES FOR ECOLOGICAL/ENVIRONMENT EDUCATION

This is only a partial listing of books and source—the latest listing would soon be out of date—check your librarian, book store, audio-visual source.

PAPERBACK BOOKS—UNDER $2.00

THE ENVIRONMENTAL HANDBOOK. Sierra Club-Ballantine (new)
ECOTACTICS. Sierra Club-Simon & Schuster (new)
THE WEB OF LIFE. By John Storer. Signet (Introduction to Ecology)
OUR PLUNDERED PLANET. By Fairfield Osborn. Little-Brown (history)
THE POPULATION BOMB. By Paul Ehrlich. Sierra Club-Ballantine (population)
A SAND COUNTY ALMANAC. By Aldo Leopold. Oxford University Press (philosophy)
THE WILDERNESS BILL OF RIGHTS. By William O. Douglas. Little-Brown (politics)

NEW HARDBACK BOOKS—$5.00–$10.00

AMERICA'S CHANGING ENVIRONMENT. Edited by Roger Reveille and H. H. Landsberg. Houghton Mifflin.
BEFORE NATURE DIES. By Jean Dorst. Houghton Mifflin.
CONSERVATION, MAINTAINING THE NATURAL BALANCE. By Joyce Jaffee, Natural History Press/Doubleday
CONSERVATION: NOW OR NEVER. By Nicholas Roosevelt. Dodd, Mead.
NATURE'S NETWORK. By Keith Reid. Natural History Press/Doubleday.
OUR PRECARIOUS HABITAT. By Melvin A. Bernarde. Norton.
SINCE SILENT SPRING. By Frank Graham, Jr. Houghton Mafflin.
TERRACIDE—AMERICA'S DESTRUCTION OF HER LIVING ENVIRONMENT. By Ron Linton. Little, Brown.
THE CONSERVATION FRAUD. By Charles Zurhost. Cowles.
THE ENVIRONMENTAL REVOLUTION. By Max Michelson. McGraw-Hill.
(Bibliography Reprinted from Saturday Review, March 7, 1970)

FILM SOURCES

Carousel Films, Inc., 1501 Broadway, New York, N.Y. 10036
Conservation Foundation, 1250 Connecticut Ave., N.W., Washington, D.C. 20036
Environmental Control, 12720 Twinbrook Parkway, Rockville, Maryland 20852, Attention: Tom Edgar
Extension Media Center, University of California, Berkeley, California 94720
Encyclopedia Britannica, Educational Corporation 425 Michigan Avenue, Chicago, Illinois 60611
National Film Board of Canada, Toronto, Canada
Stuart Finley Producers, 3428 Mansfield Road, Falls Church, Virginia 22041
Public Health Service, Audio Visual Facility, Atlanta, George 30333
State Fish and Game Departments
Local Planned Parenthood Offices for films on population

Speakers are usually available from most federal, state, and local agencies concerned directly or indirectly with environmental problems as well as planned parenthood speakers on all phases of the population problem.

If your activities for Survival Day have been even moderately successful, more questions have been raised than answered. This is one of the first steps toward true progress, but that is in the future. The great significance of Survival Day 1970 will not be the noble achievements attained but the noble efforts begun.

Mr. BRADEMAS. What can you tell us about your views on what kind of teacher training activities should be undertaken if this bill were enacted into law?

Mr. MEGEL. The vast amount of material that is now available makes a teacher training program a very simple one. Teacher training is important and must be emphasized in the directions in which we can find a goal.

Mr. BRADEMAS. I believe that another witness earlier last week told us that one of the most difficult levels at which to introduce new curriculum materials is at the secondary level, which we observed is the level at which education in our schools is most departmentalized and where teachers might be somewhat less open to the idea of undertaking a new program of studies of the kind represented by this bill.

The point I think is analogous to the charge that seems to be rather widely accepted that we are much too departmentalized at the university level in the field of environmental education.

Mr. MEGEL. It is entirely possible that these subjects could be introduced into many of the established programs in your secondary schools. As a general science teacher for many years in the Chicago schools, I know it would be very easy for the general science teacher in the freshman year to introduce one unit on ecology along with other discussions in general science, such as water and natural resources. It would be very simple to include another unit on ecology.

It would also be a simple matter in the social studies programs to introduce ecology units. I feel that it is true that the secondary school has been departmentalized, but that introduction of new material is not difficult, as evidenced by the introduction of space age material.

Mr. BRADEMAS. Just one other question. Do you find in your travels across the country and from your correspondence with teachers and leaders of the AFT across the country that there is a rising interest in environmental education on the part of school teachers?

Mr. MEGEL. Yes, indeed; very, very considerably because of the conditions which—we discussed in my presentation—conditions of which all teachers are well aware and wish to correct. There is great desire on the part of teachers to participate in these programs.

Mr. BRADEMAS. Thank you.

Mr. Hansen?

Mr. HANSEN. Thank you, Mr. Chairman.

I appreciate your coming to give us the benefit of your comments on the bill and on the problem that it is designed to help solve.

I noted in your reference to the program proposed by the Environmental Action clearinghouse that there are a number of specific projects that are recommended to be undertaken. A number of them make reference to local polluters and my question is whether we can identify any local nonpolluters.

Mr. MEGEL. I am sure that there are some that you could identify. However, our topic is concerned with elimination of pollution, water, air, and therefore we must give attention to the sources of these pollutions.

Mr HANSEN. Meaning that there are some of us that are polluters and some are not; would that be a correct assessment?

Mr. MEGEL. I think that is correct except that we are not pointing out those who are nonpolluters, because it isn't germane to your present interests.

Mr. HANSEN. One of the witnesses, during the early part of our hearings a couple of weeks ago, I think, in emphasizing the importance of avoiding the panic, crash program approach to this problem, pointed out that the industrial sector of our society produces goods and pollutes the environment, but that the problem isn't so much what they produce as it is our demands for what they produce and that perhaps maybe we should reassess our own system of values and determine that we can best improve the quality of the environment by scaling down some of our demands.

Would you agree with that assertion?

Mr. **Megel.** No, I would not. I think that our demands are necessary and can be fulfilled. There are ways and methods by which the pollution that results from the fulfillment of these demands can be corrected. I can give you a very specific illustration.

On one of my visits to Marquette, Mich., on Lake Superior, on the Northern Peninsula, I passed a plant which was making charcoal. The smoke from this plant became so excessive that the citizens demanded they do something about it. So the company brought in some chemists. Within a very short time the chemists were able to filter out the smoke and, by electric wires and other devices, to change the smoke in useful byproducts.

So, today the plant is making more money on the byproducts of the smoke than it did before on the charcoal that it manufactured.

I am sure this is the kind of imagination that can be applied to many other industries and useful byproducts can be formed.

Mr. **Hansen.** One of the witnesses who testified earlier today, Mr. Aldrich, said that the major thrust in environmental education must be toward developing the individual's ability to understand himself as a subject, both individually and in the community. Would you agree with that statement?

Mr. **Megel.** Yes, I would. Of course, that comes back to education; to understand is a matter of education.

Mr. **Hansen.** So, would it be correct to say that our purpose in this legislation, with whatever impetus it can furnish toward educational efforts, should be not only toward understanding the immediate and obvious and visible threats to the quality of the environment and the technology that must be developed and applied to overcome it, but it also has to involve really a change of our individual values, of our place in society, our relationship with each other?

Mr. **Megel.** I agree with that completely. It is necessary to unify all of these ideas into a correlated program.

Mr. **Hansen.** Thank you very much.

Mr. **Brademas.** Mr. Scheuer?

Mr. **Scheuer.** Thank you very much for your testimony.

Mr. **Brademas.** Thank you very much, Mr. Megel. We appreciate your being with us this morning.

Mr. **Megel.** Thank you for the opportunity to appear.

Mr. **Brademas.** The subcommittee will resume consideration of this bill at 9:30 in this room. The subcommittee is adjourned.

(Whereupon, at 12 noon the subcommittee recessed, to reconvene at 9:30 a.m. of the following day, Wednesday, April 8, 1970.)

ENVIRONMENTAL QUALITY EDUCATION ACT

WEDNESDAY, APRIL 8, 1970

House of Representatives,
Select Subcommittee on Education
of the Committee on Education and Labor,
Washington, D.C.

The subcommittee met at 9:40 a.m., pursuant to recess, in room 2175, Rayburn House Office Building, Hon. John Brademas (chairman of the subcommittee) presiding.

Present: Representatives Brademas, Meeds, Scheuer, Reid, Bell, Collins, Landgrebe, and Hansen.

Staff members present: Jack G. Duncan, counsel; Ronald L. Katz, assistant staff director; Arlene Horowitz, staff assistant; Toni Immerman, clerk; Maureen Orth, consultant; and Marty LaVor, minority legislative coordinator.

Mr. Brademas. The subcommittee will come to order. We shall today continue consideration of H.R. 14753, the Environmental Quality Education Act, and related bills.

The Chair would like to announce that we shall continue our hearings on this legislation tomorrow morning at 9:30 with Dr. John Cantlon, ecologist, from Michigan State University, followed by a panel of representatives from the American Wildlife Federation, The League of Women Voters, Izaak Walton League, and the Citizens Committee on Natural Resources.

On Friday morning, at the same hour, we shall continue our hearings here in Washington, and then, on Saturday morning, the subcommittee will be conducting hearings on this legislation in New York City. An announcement of the witnesses for the New York City hearings will be made later today.

We are most pleased to have as our first witness today a distinguished American, president of the Scientists Institute for Public Information, curator emeritus of ethnology at the American Museum of Natural History, and, according to the latest issues of *Look* magazine, the world's scrappiest anthropologist. We are pleased to have Dr. Margaret Mead with us.

STATEMENT OF DR. MARGARET MEAD, ANTHROPOLOGIST; DIRECTOR OF AMERICAN MUSEUM OF NATURAL HISTORY

Dr. Mead. Mr. Chairman, I don't believe that it is necessary for me to reiterate the state the environment is in or to describe the horrors and dangers that we are confronted with if we don't do something about it.

However, I would like to speak briefly on the fact that I think we are tending to diabolize, either ourselves or any portion of the committee we can put the blame on at the expense of the others, instead of recognizing that the environmental crisis we are in is primarily due to the fact that the population explosion and technological explosion have crept up on us and found us totally unprepared. I think it is quite correct to call us unprepared.

I have watched primitive people in New Guinea and I have had an opportunity to look at the environmental conservation practiced by people in the Stone Age, who had a rather acute understanding of what was happening, acute enough so that they would bring their drinking water from 2 miles away so that it was not contaminated by burials, and who were able to think about the world enough to say that the reason people had to die is that they would otherwise be buried under their own waste.

I think it is important for us to recognize that as people change from one situation to the other, they are unable to cope with environmental problems, so we have brought primitive and peasant peoples used to living in the countries into the city, and they have thrown their garbage out the window, where previously they would have thrown it out to the pigs and the pigs would have dealt with it quite adequately.

As a people, Americans came from small, compact communities in Europe that had longstanding customary rules of how houses were built and how the community was handled into what looked to them like a wilderness which was made, in many ways, into an enemy as they tried to make their home in it, we have carried over a great many of those wasteful, exploitive attitudes, and each person is trying to build himself a small castle within the wilderness, with a tremendous disregard of what happens to anyone else.

Also, I think it has been a mistake that each segment of the community has tended to blame another segment. Industry has been blamed without the community trying to provide any legal restraints or cooperative measures to be taken together with industry. As long as we could blame industry and do nothing about it, nobody had to do anything about it. So, we have failed to recognize the extent to which the consequences are shared. We fail to recognize and look for who has the longest stake in the preservation of the environment of any community or region, and we fail to recognize that our populations have become so mobile, our inner cities have become so impotent to correct the difficulties, that we need a quite different kind of structure if we are going to be able to deal (with the environment) on a long-term basis.

You very often find that the power company that is at present treated as the enemy of the community, is the one group that may have a long-term stake in what is happening, and we ought to build their long-term stake much more efficiently into our planning.

We also have almost no way at present for getting the people who pay together with the people who benefit at any stage or level of what is happening.

I think all this is relevant to the importance of wide-spread education and the kind of education that is contemplated in your bill, because the thing that we are going to have to face in dealing adequately with the environment which I don't think we are properly facing yet—is what a long term, continuous, and ultimately rather boring activity it is going to be. It is going to be very much like good housekeeping, you know, and the dishes are never done. There are always dishes tomorrow morning.

From this point of view, women may have something to contribute.

Mr. SCHEUER. It really is global good housekeeping.

Dr. MEAD. It is global housekeeping. When we discuss thermal pollution or the wreck of the oceans, or we may not be able to live here at all in 50 years, this has a fine, dramatic flavor, but once we have got past the first essential legislation, established worldwide monitoring systems to monitor problems of pollution or danger, once these mechanisms have been set up, we are going to have the problem of maintenance.

The people of the United States are particularly bad about maintenance. We have a great tendency to spot a danger, get very much excited, pass a bill, and then take our marbles and go home.

We wouldn't have women's liberation today if women hadn't gone home after women's suffrage was won. The scientists' committees on information worked very hard on radioactive contamination of the environment until the test ban was passed and then we saw a terrific slump all over the country.

The Civil Rights Movement got the Civil Rights Act passed, and then they, themselves, passed on to other things.

This kind of thing won't work in the case of the environment. It hasn't worked very well in any of the other cases. The things we have treated as goals were only steps and should have been treated as such. A short-term perspective won't protect the environment. We will have every polluter back polluting cheerfully in 5 years unless we build structures that will last.

I think the best structure is the continuous participation of children and high school students and college students, but particularly schoolchildren in every community, because you have a new crop of them every year, and what we need to look at now is ways of providing regenerative cycles for dealing with problems that are going to be continuous.

If we can build our whole appreciation of the environment and our education of the community with each new class of children that come into school, this will mean, of course, we will have to keep training the teachers to deal with the new children, about new things. Environmental conservation as it was taught 20 years ago wasn't coping with such things as nondegradable products. No one had anticipated, even in science fiction, some of the problems that we are confronting today.

But if we deal with schoolchildren who are continually alerted to the new world—in television, the teachers don't have the time to look at, usually—they bring in the new insights into the new situation.

So that it is creating widespread educational mechanisms with continual monitoring functions and ways of broadening the perception of children and high school students, that is probably one of the most important things we can do.

We have been disturbed by the generation gap and we have thought it was possibly a continual confrontation between adults and children, but actually, the generation gap that has been plaguing us now has a group of young people old enough to give some leadership. The senior citizens of the post-World War II generation are now 25, and they are no longer students in school. They are teachers in schools and young lawyers and young doctors, and we are building a considerable group of people now who can have some leadership and power instead of seeing themselves as helpless students, the oldest of whom was 20, over against the whole rest of the world, which was a fairly frightening situation.

We can look forward now to young leadership for one class after another of high school students who will be coming up and looking for things to do in society.

One of the troubles that we have had in the last 5 years is that there have really been very few things that such young people could do. They could demonstrate, they could sometimes influence a political decision considerably, but they were very one-shot activities, also, and if we once start on problems of the local environment and then expand them steadily to State, Nation, continental, and planetary problems, this has enough progress in it, enough change in it, to keep generation after generation of schoolchildren active, if we have the rest of the community active to and responsive to them.

So that just as we are emphasizing in the contrast between our space technology and our handling of earth at present that we have the understanding and means to recycle all our resources, but instead, we are exhausting them and throwing them away as waste and rubbish, I think if we have an educational model which is as humanly regenerative as the types of recycling physical resources that we want to have, that these two things will work very well together.

There are several implications of such a model. One of them, is that I think it would be a mistake to channel too much of the funds that will be provided by this bill to the old formal methods of the educational establishment. Such education needs to be supplemented by a good many other kinds of community activities, and especially by the types of activities where there is a cooperative effort between very senior citizens who have had enough experience to have some scope and depth and young people who are coming up. This would have some implications, I think, possibly on your advisory council. I can understand why you want 21 people on it, so you get six people to the meeting, because this is the general style today of meetings with people of prominence and responsibilities.

But we have some new inventions that can deal with this. We have the possibility of now pairing every senior member of any committee or council with a junior member who will keep up with what is happening, represent his senior if the senior isn't there, so that at any meeting you would be guaranteed a reasonable number of young people in close touch with the older people with whom they were working.

Without such a mechanism, these large committees become topheavy, and there is a terrific tendency to have a discontinuous membership with no continuity. This mechanism provides a way of feeding youthful questions into the situation.

There have been some other suggestions made of a bold nature, such as that every State legislature and possibly the Congress, itself, should take a week's recess in some environmentally interesting area where they would experience the problems of the wilderness in one form or another, and devote themselves for a week to establishing a common climate of opinion about what they are talking about.

If this should happen, one of my youthful consultants has suggested that we would be faced with the need of enough people to make speeches to 50 legislative meetings plus Congress at one time, and we don't have the resources we need.

In fact, conferences or seminars or workshops for training people to be exceedingly alert and contemporaneous in the present problems in the environment is one of the things we need to work on. So I was glad to see in your bill you were providing for the possibility of such things as workshops and conferences for the very rapid training of people who can act as resource people and teachers and in teachers' training.

The need, also, to have environmental models set up in environmental centers, I think, is very great, so that people can get a multidimensional view of the environment at the same time that they get a multidisciplinary view of the problems involved. There are several ways in which this can be done. We can use islands as training grounds for a large number of future teachers and ecological experts, as islands present us with a very good natural model of the whole earth.

It is also possible now to construct fairly easily types of models in museums and environmental centers where the participants or visitors can push a button and alter one part of the equation, population, resources, technological state of the country and so forth, and see how they can begin to arrive at either optima for that particular country, or total disaster if they push one factor too far.

This sort of demonstration where you have an opportunity, yourself, to introduce a runway into the system is far more educational than the sort of thing one gets in linear presentation in books.

One of our principal problems is to change the whole climate of feeling so that man ceases to see himself as against nature, as at war with nature, or in dominion over nature, which has been one of the interpretations, I believe fallacious, of the Old Testament admonitions to man, and instead sees himself in nature.

Now, 10 years ago we could say that it was a very good idea for urban children to be given an aquarium, and that looking at the aquarium they got some notion of a balanced environmental world. But they also got some notion of playing God. If they had tropical fish, all they had to do was to unplug electrically heated aquariums and the fish died. The notion of man as someone who can plug or unplug the system has got us in the difficulties we are in. We need a model where we are as it were in the aquarium, too, and depend on the balance of temperature and water and animal life and plant life within it, and some way in which we can see ourselves as an essential component of the environment.

I don't think this is advanced by returning to the models of how the American Indian lived, beautiful as it was. The relationship of the Indian to the environment was fine until he got hold of a gun, in which case he was as willing to destroy the game as any other people have been.

What we need are technological inventions to replace the ones we have. Instead of non-degradable containers, for instance, to think of a large part of the container industry as manufacturing something like ice cream cones, that you either eat or return to the soil in some useful form. We need to move forward, and not back, and we need to recognize the importance of technological devices, but within a new climate of opinion.

The situation is so urgent that only if we educate everyone from great-grandparents to young children, are we going to be able to move fast enough, and over the entire country, so that we won't have pockets within the country where people are unable to recognize the urgency of what is happening.

There is a contrast today between what people feel at the moment in Santa Barbara and Florida, and in some part of the country that is relatively free from trouble, and a contrast between the recognition of the population explosion between the people who live on the plains of Kansas and people who live in New York City.

It is so acute that unless we find some way of combining all of these consciousnesses together—the Australians' sense of their great empty desert that is open to invasion by the wrong "immigrants". Calcutta teetering on the edge of disaster etc.—unless we can get these all in at once, so that the regional differences on the entire planet are combined in some kind of ethic that is comparable everywhere in the world, we will go on having the sparcely populated areas not understanding the densely populated areas, and we will go on very dangerously, possibly, to international races with GNP alone. Gross national product is a gross measure, and is only indirectly related to the problems of environmental control.

We will go on to population races, possibly, instead of establishing some kind of standards which will include resources, population, the demographic composition of the population, the number of people who are older or younger, and the state of technology.

We should make it possible to compare one country with another, not in terms of which is bigger or faster, or has a population growing quicker, but instead, discuss the way each country is coming closer to an optimum for that particular country.

I think only by the most widespread simultaneous imaginative and diversified educational policy will the United States be able to take the part that it should take in this endeavor.

Mr. Brademas. Thank you very much, Dr. Mead, for an extremely provocative and valuable statement, which moves me to put several questions to you.

I know one of my colleagues said the other day that he really didn't think this bill was a very good idea, because the educational system is so bad, and the young people were so far ahead in their sensitivity to the environmental crisis that there just wasn't much point in it. My own feeling, however, is rather more represented, I think, by your statement that we need a long-term, continuous activity, and I think you said we need to build some education into a structure that will last beginning with schoolchildren.

So I take it you would feel that we need to build a dimension of environmental education into the existing school system as well as moving outside the school system in the form of community conferences, adult education programs and otherwise. Would that be an accurate representation of what you said?

Dr. MEAD. Certainly. Our school system is very archaic, but it is all we have got. It is also the only way in which young people's insights can be put back into a continual institutional framework.

Granted that the average 6-year-old child has a different perception of the world from the average 40-year-old schoolteacher, and the 6-year-old child feels things, having been born here in the space age, that the teacher had to learn as an adult "immigrant" into the last half of the 20th century and may not have learned in the same way. But unless you can pour this back continually into an educational institution, it is impossible to build it into the life of the country.

We can have one demonstration school that is outside the school building that meets in museums and railway stations and airports and shows the way to greater diversification of understanding of the environment, but you can't have a million schoolchildren meeting in quite that way and expect to get anywhere. So that I think the thing to do is to revivify and inspire the educational system. We can't possibly dispense with it.

Mr. BRADEMAS. To relate what you have just said to another point on which you commented, the question of attitudes and values, and I believe you said that we have to change our ethic so that we don't see the world as man against nature, but man as part of nature. What kinds of implications has this view for the nature of our school system? I will rephrase my question, Dr. Mead, and put it this way:

Are you saying that we really need to change our attitudes and our values generally if we are to make any effective advance in meeting the environmental crisis?

Dr. MEAD. Yes. But I am also saying that this is not an impossible task, that this country is capable of very rapid changes in value judgments and very rapid changes in the deployment of energy to solve particular problems, with the mass media, and with our general volatile temperament in regard to causes and attitudes and goals. It will be possible, first by a massive effort such as is being mounted in the colleges now for Earth Day, and then almost immediately structuralizing the results of that effort. I think it would be possible to change our values.

Let me give you a very mundane example. One of our oldest and most beautiful and most recalcitrant communities that carries on the spirit of being against any Government and against the next town was very angry because a gas station was going to be put up that was going to cut down a very beautiful tree. But it didn't occur to anybody to ask the oil company not to cut down the tree, until finally somebody had that incredibly inventive idea of discussing it with the gas company. They kept the tree and built a beautiful gas station, and now you find advertisements in the national magazines of how good oil companies are keeping old trees. This is in a matter of just a few months.

Mr. BRADEMAS. Dr. Mead, you have just published a new book, *Culture and Commitment*, in which you talk about the relationship between the youth and the older generation. What, in your judgment, explains the sudden burst of interest in the environment on the part of young people?

Dr. **Mead.** I think we have reached a critical position, and we have been able to say so. That is, the tremendous interest on the part of young people is a function of the operations of a few older people who have been persistent prophets of what has happened. So, you have an interaction between the young and the people who have been working on this very hard in the last 20 years. This is all in the last 20 years, you know.

We are not talking about the conservationists who did their best to conserve our wildlife and rivers and parks, although this was very important. We are talking about the sudden knowledge that the population explosion and the technological explosion have created something new and very dangerous.

If there had been no older members of the community worrying about this, I don't think the young people by themselves would necessarily have perceived all the particular types of dangers. It takes a combination of foresightedness and preparedness on the part of the old and activity and energy and question-asking on the part of the young. This was stated rather well at a conference I attended in Stockholm last November, which was a conference of Nobel Prize winners and other characters of that ilk from disciplines in which Nobel prizes are not given, and they invited about 20 students to come and criticize our deliberations. They started out with a statement over the loudspeaker before they came in, "Your average age is 61. Our average age is 21. The waters are rising; we have no tools to build boats."

I see the task of the older generation to provide the tools to build the boats. This is what the Scientists Institute for Public Information is attempting to do. and doing workbooks for the April 22 Earth Day, providing the technological background out of which young people can take the lead in what is happening.

Mr. **Brademas.** Thank you. I have other questions, but so do my colleagues here.

Mr. Reid?

Mr. **Reid.** Thank you, Mr. Chairman, and I am very happy to welcome you here this morning. I think what you have already said here today, and indeed, in your *Look* magazine article, is more than pertinent.

Let me ask you in connection with the latter how you see our society becoming sufficiently concerned about preserving air and water? I think you touched on that in the *Look* magazine article, that we have thought a little bit in terms of village units and supplies without thinking of the basic need to preserve air and water for the individual.

Dr. **Mead.** I think that we have to combine our value for individuals with our value for the whole society and in the end for the whole planet; they are inseparable.

In the past, one of the ways that we have made individuals safe is to let them accumulate as much as possible of property and land and establish a series of little fortresses within which they could use as much power as Nero used in his palace in order to establish a hygienic, safe, comfortable form of life.

For individual families this is no longer tenable. It is no longer tenable for the United States to be using something like 50 percent of the world's irreplaceable resources.

We are going to have to establish forms of safety and comfort and health that don't draw so heavily on resources, and that don't have such an extraordinary polluting effect of every sort on the environment around us. So that we are going to have to devise ways of showing that the welfare of each individual is much more inextricably connected with the welfare not only of his village, but his State, region, Nation, continent, and the world, than we have felt in the past, or, indeed, was true in the past.

The welfare of somebody who lived in Central Europe in the fourth century was not closely tied to an Inca Indian in South America. They were totally out of reach of one another. So, this is a new situation, too, and we haven't the ethic of valuing in each individual which fits the degree of interdependence of the individual in the whole world today.

Mr. REID. Do you think there is a recognition that there are finite resources, for example, that we may have 10 years left in terms of the air we presently have, that we might run out of water in the United States in the mid-1970's, that we could have a worldwide famine if we don't do something about population control very rapidly, that at the rate we are moving on DDT in the Federal Government, we will perhaps eliminate most of the species on the earth by 1975? Is there a growing recognition that there is great urgency, and that there are very definite limits to our planetary resources?

Dr. MEAD. There is growing recognition. I am afraid we will overstate the point until it looks like crying "wolf," and nobody will believe it. I think that is what has happened to the older generation, and what we need is a young shepherd who never heard anybody cry "wolf" before.

I think we ought to be careful to make minimal statements. We know the population will double to something between 6 and 7 billion. Let's not argue as to which it is going to be, plus or minus 300 million. Take the minimal figure, it is quite bad enough. If we take the minimal figure at every point, the possibilities of more oil slicks, thermal pollution along the east coast, the effect on the total atmosphere of changes in temperature, and the possible pollution of the oceans, if we take the minimal figure in each case that everybody agrees on, we will build a picture that requires sufficiently urgent action, and keep the extreme alarmists from overstating their position.

I think Jean Mayer's point, that we are not going to have a terrible famine by 1975 that will wipe out half of the world population, but we need be more worried than if we were going to have a famine because we will have food enough to just make them sick, and make the whole character of their life qualitatively poor, and this is the terrible possible menace, that the quality of life will sink and sink without any arresting total disaster.

There are too many people around at present who don't mind total disaster. Americans never really have minded total disasters, if you don't know what hit you. That was our initial response to the bomb when I did some interviewing the day after Hiroshima. The first thing Americans said was, "Well, you'd never know what hit you."

With that approach, if all we are going to say is something is going to hit us and we won't be here to know it, I think it would be rather dangerous. Americans didn't start worrying about the bomb until John Hershey wrote his book on Hiroshima and Americans realized that doctors and nurses won't be there. You might lie there suffering for 24 hours before you died. Then we worried.

Now, if we make total disaster pictures, people say, "All right, live it up, that is all there is, nothing to work for, and we are going to be choked to death, strangled to death, smogged to death pretty soon anyway."

But if we say, "Life is going to get steadily worse, but we are going to be here"—[laughter].

Mr. **Reid**. I am sure we are going to be here. You talked this morning about better housekeeping and better maintenance. Have you studied what Israel has done in terms of reutilization of resources, whether it be reutilization of sewage or how they are preserving water, various ways of reutilization of resources?

Dr. **Mead**. Israel, of course, has been an outstanding example of conscious, disciplined attempts to take what was a desert or exceedingly bad land and use it. They also demonstrate and can be an example in some cases, about failure to take everything into account, so that some of the reforestation is not the sort they would do today if they were to do it over.

I think the study of a country that very consciously had to deal with a bad environment and did it, a study of some of their mistakes and their failures is probably one of the most useful things we can do. They can say today what they would do differently with more experience.

We don't have very many living experiences, and when we get an example like Israel, it is valuable to us.

Mr. **Reid**. Thank you, Mr. Chairman.

Mr. Scheuer?

Mr. **Scheuer**. I want to welcome you here today, Dr. Mead, and say that some of the great experiences of my life were two successive summers in the ancient Greek amphitheater in Delos watching you declaim to the gods on Mount Olympus your environmental ethic. I might say you not only stamped it indelibly in my memory, but last summer, as you recall, we had the first conversations that led to the bill we are now discussing. So, I am eternally in your debt as a student.

A couple of questions. We have been troubled, by the feeling in the poor and the black communities that the new interest in the environment on the college campuses is a cop-out from the urgent pressing problems of cities, that it is a middle-class white phenomenon which really isn't relevant to the poor, the minorities and the blacks.

How do you think we can present this as not a cop-out, but rather as something that goes to the very core of the problem of making urban life not only tolerable, but attractive and interesting and pleasant for everybody, especially for the poor and the blacks who live in the worst part of the urban environment, and who in many ways are the greatest sufferers from our depradations of the environment.

Dr. **Mead**. You know, we find the same thing, Mr. Scheuer, when we have an international conference. People who come from communities that don't have running water yet say they aren't worried about detergents coming up to the 16th floor of an apartment house. As far as they are concerned, getting water piped into a community is valuable. We have the same dangers of lack of understanding from people who have not been overwhelmed by the new technology as we have from people who are contending with the results in an impoverished artificial environment.

I think we have got to do the whole thing at once. We have got to face the man-made environment of the inner-city, which is essentially man-made, it is dangerous, and bad and it must be remade. At the same time that we talk about Yellowstone Park or what should be done about those bears that have to be re-educated so that they won't eat out of garbage pails any more—which I think is fascinating, but I can understand a poor mother with five children with no shoes and likely to be eaten by rats not to be concerned about the bears—or even their long-term re-education! We have to talk about both things at once: how the rats are driven into the cities when you burn the countryside, as has happened in Vietnam, and then in the cities you get plague. We have to talk about the interrelationship between the depopulation of the countryside with, soil erosion, the way in which we are handling new machinery in the country, which drives people into the cities, which drives them into poverty. We have got to talk about all those things at once.

The problem of talking about everything at once is something that we have never been able to solve in the past, but that we can do now with computers and with complex models, so that it is perfectly possible to show that as you pile people up in the cities you then get effects on the atmosphere, for instance, and smog, which react backwards, and you can relate back and forth and never forgetting the people who are suffering the most now.

I think it is very important that, unless we talk about people who are suffering now, we cannot expect anybody to worry about people who are going to suffer later. That is the reason that I chose for the workbook that I did for Earth Day, hunger, because as long as we tolerate hunger in the United States, where are we going to get people who are going to worry about pollution or ugliness of the environment 50 years from now?

Mr. SCHEUER. One followup question on that. In your answer to Congressman Brademas you said that we had to work with the school system, that it was all we had, and that we had to bring it into the 20th century.

In your opening remarks you discussed working not only with the education establishment, but also with other community groups. Can you give some specifics that we might write into the bill or into the report that accompanies the legislation about noneducation establishment foci of education on the environment, both urban and rural? What are these nonschool institutions through which we could work?

Dr. MEAD. Well, they are, of course, other establishment institutions, such as museums and science centers and children's museums, special programs developed by industries with particular scientific commitment, science fairs, all of these established nonestablishment, or established noneducational establishment institutions.

I suppose, and I don't know whether it would be too difficult, I am not an expert in writing congressional bills: If you could build some kind of balance into the picture, that is, if you could say if you want money for your own school system in this community, State, region, whatever is the useful unit, you need also some balancing adult education.

So, it could be said to a school system if you can come up and say, "we have done all this for the elementary school," the reply would be "then you get money for a balancing effort out in the community," something of this sort which would move toward including all ages, multidisciplinary, multi-institutional activity.

I don't know whether that would get us into the kind of finagling we get into, where we would just bootleg adult education—we are such wonderful bootleggers—but some form in which a community is rewarded, and the more it does, the more it is rewarded, and it realizes if it lets something slip—you see, as Newark was proposing to close its museums, and we went through a period last year in New York where the first bright thing we thought of doing to economize was to cut down on our appropriations to those institutions where the children are going to learn something which might be relevant to having a city where you would not have to economize in this way.

So, if we could bring rewards to a community that is doing something closer to the community, and also penalties, I think this might be an advantage.

Mr. Scheuer. One last question: You talked about the application of computers and complex models to parts of the environment.

Don't you think it would help if you could get your colleagues in the universities, the engineering schools and industry to give us some scholarly measure of the environmental trade-offs we make when we opt for more population, more automobiles, more hair dryers and electric toothbrushes? Shouldn't there be a scientific, unemotional cost-benefit measure that we could apply to all of these things to dramatize the effect of extra GNP, extra so-called convenience on the quality of our lives in an unemotional way?

Mr. Brademas. Would the gentleman yield?

Mr. Scheuer. Yes.

Mr. Brademas. I was going to ask a similar question. I take it you would not quarrel with a supplement to your question by saying, why can the computers not be used to simulate the variance?

Dr. Mead. And also to show the effects of choices we have to make.

Mr. Scheuer. And when we know that there is no way of producing power, either by the fossil fuels or by atomic energy, that doesn't have environmental fallout, we are realizing that we have to make a decision between a sacrifice in the quality of our water and the quality of our air or on additional convenience such as the electric toothbrush. I am very impressed by your unemotional approach of not overstating things, of not uttering wild, unfounded suggestions of dire calamity, indeed of not losing our credibility.

It seems to me that we must include in our scientific thinking consideration of the actual trade-offs that we are making in our decisions I ask you as a scholar who believes in the empirical method, cannot the computer, cannot science, reason and the university and industry's talent be applied to make the trade-offs evident to all of us?

Dr. Mead. It can. I think we have to press on doing things from several levels. We need a good simulation now of this planet at the very least, and its place in the solar system. Unless we do that, we are not going to judge accurately what we do with changing the nature of the oceans, for instance, and possibly irreparably, or possibly setting up planetarywide activities, so that we need a simulation for the whole earth. This does not exist.

We do not have the whole in which to instill the parts, and you are not going to be able to talk about the effect in the United States of so many hair dryers or electric toothbrushes or whatever, and the minerals they use on the nondegradable products that they result in, without this wider context, also, so I think it is necessary to have a series of computerized simulations that will show, if we go in the direction of more roads, and roadbuilding instead of housebuilding, what this means also in encouraging more automobiles with one person in each, polluting the atmosphere and providing junk heaps, as compared to planning new kinds of cities with much smaller-sized individual transport, but maybe much larger and better city to city transport, so that we can see housing and transportation draw differentially on our resources and result in different kinds of contamination and waste, but both of them can be related to our knowledge and human resources for a better way of life.

Mr. SCHEUER. Where would you say this environmental earth model ought to be?

Dr. MEAD. The whole earth model we had better start working on on a national basis. We are beginning international monitoring now, which is very important. We have international weather monitoring. We need international things going at once, but for education of this country, if we have a reasonable earth simulation, and then we could move down so that each small community could build a simulation of what is going to happen to it if something doesn't change up river or they don't stop doing something to their own beach.

Mr. BRADEMAS. Mr. Bell?

Mr. BELL. Thank you, Mr. Chairman.

Dr. Mead, I also want to welcome you before the committee and comment on your very excellent statements.

I wonder, inasmuch as my colleague, Mr. Reid, mentioned the problems we have immediately facing us of a concrete nature involving pollution, whether you would favor such a program as advocated by Dr. Libby of UCLA. He suggested that we establish a school of ecology, in effect, a school in which we train specialists in this field, as we would train a doctor for medicine, that we have a program such as "medical school" for ecologists. Do you think this would be one of the better alternative ways of attacking the problem specifically?

Dr. MEAD. I think we need a number of such schools. Our resources at present are rather poor, and we have to deploy them as widely as possible. There have been schools of ecology that have totally ignored human beings. There have been schools of human ecology which have totally ignored the environment.

There are institutions where the public health emphasis is extreme but many other things are completely ignored. I think we need more inclusive ecological centers than any that we have yet established, and I would like to see them set up with internships on islands.

At present, I don't know any better way of really educating someone to understand an environment than to give him a small island with a real problem to solve on it, and most of the islands of the world are in terrible trouble, so they could use a large number of interns working on their problems of conservation, of balance, of new crops, of protection of the soil, migration of population, and so forth. They have got everything to worry about, and we could connect them into a series of ecological centers where people were trained. We are going to have to do it if we are going to do anything really in the schools.

Things don't start in the schools. They have to start at a high level of understanding, and then we have to put it in a form that people can understand, especially now when the children grow up with so much more experiential insight into the whole world than their teachers have.

So, if I understand your question right, I think that one of the possibilities of a program such as this envisaged in this bill would be the encouragement of such schools, where a new kind of—I don't like to call him a specialist, because he has to be extraordinarily inclusive—but a new kind of practictioner in the task of preserving the world is trained.

Mr. **Bell.** Dr. Mead, in answer to Mr. Brademas' question, you mentioned youth's concern for ecology and why they seemed to take this banner up so quickly. I wonder if you would discuss that a little further. Why is it that they would take this matter up when there are so many other things they could take up, too? I realize the importance of this, but there are other problems, such as poverty in the cities and so on. Why is it that they seem to grab at revolution against organized society, the military or somthing of this kind? Is that the basic background behind this?

Dr. **Mead.** I don't think this is taken up for those reasons. I think we have to allow a little for the drama, and that you are unlikely to get a nationwide cause out of something that has no dramatic potential, and we have quite often found that fear of contaminants in the environment is a disguised fear of a nuclear war.

We did some studies just before the first pesticide report was released, and we found that what people were actually talking about most of the time was a fear of total annihilation, and they talked about it under the heading of what DDT would do to you, or something of this sort.

I think there is a very widespread feeling among the young people that we may be on the verge of catastrophy. It is very startling to talk to the head mistress of a girls' school, a school for children of the privileged, and a girls' school to which they send the gentler girls, who might not stand up to bigger schools, and when I asked her last year what was the prevailing mood of the senior class, and she said, "Despair." These are 17-year-olds living in a city where they, themselves, had every privilege and possibility.

Now, I think that the problem of environment gives hope, while it expresses the despair. If you think about the fact that you don't want the oceans polluted, that you do want living creatures to continue on this earth in some kind of balance, that you want to conserve the soil, that you want to get a balanced population, then you are thinking about the future, however much you may be battling against the enormous wickedness of the contemporary use of things.

Mr. BELL. One more question, Dr. Mead. I gathered, also from your comments, that you feel in some cases the whole battle against the problems of ecology should, as much as possible, be internationalized and one of the great writers of Sweden made this quite clear. He thought that one of the most important aspects is for us to try to internationalize as much as possible. Would you concur in this, that this is a problem that has to be dealt with internationally?

Dr. MEAD. It has to be, because oceans wash against different shores, and as I once heard the head of the Air Force Academy say, when you got a few miles up, the boundaries between nations didn't matter much.

Sweden is in a particularly good position to appreciate this fact. We are not in quite as good a position. It isn't demonstrated to us so often. It is perhaps unfortunate that the major example of which we must take account comes from the fact that we are extracting extremely valuable and irreplaceable materials from other nations for our benefit, and when we export benefits such as new kinds of seed, we are also in danger of exporting fertilizers and pesticides which will spread environmental imbalance in other countries.

It takes a greater act of the imagination on our part to realize how international this problem is than it does for Belgium or Holland or Sweden. That is perhaps the reason that Sweden is taking the lead in preparing for the big United Nations Conference on the Environment in 1972, which, I think, it is very important that the United States should support up to the hilt.

Mr. BELL. In view of what you just said, and in view of the selfish problems that many nations, including ours, face, do you see any prospect of internationalization really happening with any rapidity?

Dr. MEAD. I think so. These are the fields in which cooperation has been easiest. Antarctica, which is essentially an environmental piece of cooperation, 12 nations have been involved in handling Antarctica in a way we have never done before.

The whole weather satellite program is one in which there has been a great deal of international cooperation. Here, I think, it is important to realize these are not the problems of capitalist countries alone, that Socialist and Communist countries have been no more successful than we have in solving the major problems. They have sometimes been more successful in getting a good-looking center of the city, but when it comes to the contamination of water, to smog, to dangers to the soil, to the handling of wastes, they aren't doing any better than we are. These are not problems of a particular ideology or a particular economic system; any time this is so we have a much better chance of international cooperation.

Mr. BELL. Thank you, Dr. Mead.

Mr. BRADEMAS. Mr. Meeds?

Mr. MEEDS. Thank you, Mr. Chairman.

Dr. Mead, this has certainly been a rare experience for me. It is my first occasion to hear you speak, and I am very impressed.

And your testimony has made me very proud of my own congressional district, because the laboratory about which you have spoken so eloquently, I think, is in being, the type of laboratory about which you spoke is in being in the Second Congressional District of Washington. A 586-acre site, controlled by a consortium of 21 school districts, colleges, and universities, the Department of Natural Resources, one of the colleges being Huxley College, which is an addition to Western Washington College, and totally dedicated to ecological study.

They are running this 586-acre tract with the ideas that you have expressed here, manipulation and alteration of the environment, experimentation, collection of laboratory specimens, projects and demonstrations, forest management, conservation projects, such as study of erosion, air and water pollution, devising environmental curriculums, and teacher training in the whole subject of environment.

They have been at this, now, for approximately 8 months, and are very interested in this legislation, and we are hopeful we can pass it so we can give them financial aid.

So, I just wanted to report to you that the type of things you are talking about, in this small way, are presently underway.

But that is not my question. My question is, I have the same fear that Mr. Scheuer expressed a little earlier, and that is that I feel our concern about the environment today is largely a middle-class ethic, and that we are failing almost completely in our concern about environment to take into consideration the more basic problems of the cities and the urban areas of this Nation.

We are really not relating to those problems when we are talking about environment. The average person that talks about environment is not talking about the rats in apartments in downtown Washington, D.C., and he is not talking about the garbage and the filth on the streets and in the alleys and in the hallways of people who are actually living under these conditions.

So, my question becomes one which would try to elicit from you the kind of fear that we can make this bill, perhaps, more responsive to that problem.

Maybe I am incorrect when I ask the question. Maybe this is not the case, but I feel it is.

Dr. MEAD. There are people who are saying so. There are a lot of people who enjoy producing endless red herrings by saying that we are doing something instead of something else. There is a group of people in this country who say that the whole environmental ploy was invented by the establishment in order to take the students' minds off the Vietnam war. I am old enough to remember that there were people who said that Lindbergh crossed the Atlantic in order to take people's minds off the coming depression. I think such accusations are a typical form of American political activity, but it can be overdone.

I do not think something is bad because it comes from the middle class who happen to be in colleges with time to think, and I don't know who is going to do the thinking if it isn't done by people who have time to think, and I think to brand any activity as either black or white, rich or poor, middle class or upper class or lower class, or no class, or hippie, doesn't help very much.

I think what we have to emphasize, and what we don't do enough of is emphasize the wholeness of the problem. This is partly because the conservation movement got combined with the antipollution movement, and so we have all the bears in the picture. We must emphasize that man is building himself an environment, that we must not merely conserve air and water and earth, but we must build the place we live, and most of us live in an artificial environment, but we must build this with due regard for all the resources and the handling of the natural environment.

We are condemning humans to live in a dangerous physical environment. We can't keep them separate. Some people now insist that "every prospect pleases, and only man is vile," or complain "Isn't it awful that we are going to the moon when we are not doing anything on earth?" And "We are thinking about the wilds where the middle class like to go, while the poor are sweltering."

I don't think we should deal with these dichotomies. The country is rich enough in intelligence and resources to do all of these things, and the more we do of one, the more we will be able to do of another. We should not regard our present resources as if they were gold pieces and we have only 10, so if we put two into this we can't put any into something else.

Because the healthier the country is, the more people who live in the ghetto who have decent jobs and are able to buy things and keep the wheels of commerce turning, the more financial resources we devote to improving the environment.

Mr. **Meeds**. That is my question. How do we get the whole concern about environment to touch on the things you just mentioned? I personally do not think it is now, and I am seeking your advice on how we might make it more relevant to those problems.

Mr. **Mead**. When you recapitulated all the things that are being done within your constituency, you didn't say much about human beings.

Mr. **Meeds**. And unfortunately, that is one of my great concerns about it, because I personally feel that they are going to go off out there in their 586 acre tract and study the environment and pollution and a number of other things, but they are not going to think very much about the people in the core cities of this Nation who have an environmental problem, but one which is, and I don't say it is different, because it certainly is very similar, but one which is certainly more pressing and more volatile, and I would like to get your advice on how we enlarge this study of environment about which there is so much concern today and so much ingenuity and effort, how we enlarge this and also make the study of our cities and the problem after improvements of our cities a part of it.

Dr. **Mead**. I wouldn't use the word "also." I would simply say we have to put ourselves inside the system within which we live. And if you live in a nice remote meadow somewhere in a low-populated State, you must learn to see the extent you cannot cut yourself off from the big cities nearby, or even the small cities, with slums, waste, pollution. The two things are totally interrelated.

That is the reason I don't want to talk about the environment without talking about hunger, because I don't think anybody is going to care what happens 50 years from now if they are uncompassionate about the fact that people are starving in the United States right now. And I think that is part of our handling of the environment.

Mr. **Meeds**. It certainly is. Thank you, Mr. Chairman.

Mr. **Brademas**. Mr. Collins?

Mr. COLLINS. Thank you. I have no questions.

I am glad to have a witness who speaks extemporaneously so well.

Mr. BRADEMAS. I know Mr. Hansen has a question or two. And because I have a couple I haven't put to you, I will put them to you.

You have been identified for a number of years with museums. What kind of a role can museums play in the United States in environmental education?

Dr. MEAD. I think museums are in somewhat the same state of mind as the rest of the Nation is. They want to breakout of whatever walls they are in and expand and become relevant. So they are very ready to relate themselves more widely to a wider constituency, both in the local neighborhoods, and like most institutions of learning, and they are located in bad neighborhoods and close to slums. They are ready to include the immediate neighborhood in an understanding of the environment, which means just the sort of thing that Mr. Meeds was talking about and that Mr. Scheuer has been discussing. That is, they can become centers where discussions of the modification of the immediate environment can become part of their activity.

Also, they can do a great deal with extending what they are doing right about the environment out over the Nation in different widespread ways.

In my new hall, for instance, when I build dioramas, I am building them so the top will come off and they will be on wheels, so it can be immediately put on television.

We can think of museums not only as a place where children come in enormous mobs in buses and perhaps see something, but also as centers of dissemination of information and of a much more living relationship to their constituency.

Mr. BRADEMAS. Mr. Hansen?

Mr. HANSEN. Thank you, Mr. Chairman.

Let me join my colleagues, Dr. Mead, in expressing our very sincere appreciation to you for your help this morning. I think you have made an enormous contribution to these hearings, for which we are most grateful.

I was interested in your reference to the international aspects of the problem. We have been referred to by Van Loon in his "Geography" as "fellow passengers on the same planet," with a responsibility to be concerned for the welfare of all earth inhabitants. In looking at the international aspects of the problem and our obligations, what mechanisms or organizations or institutions that reach across national borders might we look to to help attack problems of pollution, degradation of the environment on a global basis?

Dr. MEAD. I think the first thing we need is monitoring. We need to have institutions that have surveillance over what is happening on the entire planet, that can simultaneously take in information about changes in temperature in one ocean and another ocean, about the movement of birds that give us indications of what is happening in different parts of the world, so that we have the sort of international monitoring that could grow out of something like the International Biological Program that has been going on.

We need interscientific human instrumentality, that is, groups that will be monitoring what is going on. And we need the location of listening posts that are internationally responsible around the world, the kind of monitoring by air that is now being proposed. Then we need models into which this data can be fed, so that it is available to people in different parts of the world.

I think this means a concept of an international university that is not located in one place but is a network of institutions, each international in character, that extend over the surface of the earth. And, of course, concretely right now it means adequate preparation for the United Nation's big conference on the environment in 1972. This provides the kind of focus for the preparation of materials and the devising of new institutions, which is what we need.

Mr. HANSEN. I have another question or two.

I might say I was particularly pleased at your reference to programs and policies that would help stem the tide of migration to the cities and your emphasis on the need to keep people in the rural areas, which I agree with. And I would hope that in this effort we can clearly identify perhaps some specific ways in which we will be able to increase economic opportunity in rural areas.

It seems to me that we benefit in both ways. The migration to the cities has not only caused a deterioration of the conditions that contribute to quality of living in the cities, but it does damage to the rural area at the same time. As the villages are abandoned, the windows are broken, the stores become vacant, we see the same deterioration that we have in the cities.

Would you care to comment further on this aspect of the problem?

Dr. MEAD. I think there are two elements here that have to be taken into account. One is our relationship to newly industrializing countries in the post-World War II period. We put far too much emphasis on heavy industry, and a manufacturer of good for export, and too little emphasis on rural areas. Almost nothing was done for agriculture, and almost nothing was done, comparably, at least, for housing.

Housing and the human settlements have never been regarded by economists as part of the productive process, so they have been regarded as a form of consumption that sometimes help the building trades, but they have not included them as necessary costs in a society if you are going to have a good life.

You define the "good life" by GNP, but you don't put any kind of housing or human-settlement planning into it.

One of the emphases of the science of human settlements, of ekistics, that I think is important is, we emphasize dealing with the smallest rural community, with a little migratory group of people living in canoes in the reeds, all the way up to the city, and do not put urban affairs over against rural affairs, put them in separate agencies and put them in competitive situations.

In the 1930s in this country we had a subject called "rural sociology," and the people who worked in it never read anything about a town that had more than 2,500 people in it, because this was the definition of the Department of Agriculture. This was rural life. Unless we can now take the whole thing together and think about the effect on the country and on the city, and also have a rather new concept of the city—that is, that what we anticipate in the future, that whereas the man once had to wall his town to keep dangerous nature out, he may have to wall a few pieces of the wilderness to keep dangerous man out.

But for the most part, we will live in widespread areas that have urban facilities for transportation, education, and at the same time we will contain agricultural areas within them, and that the old notion of the compact city, ringed by suburbs, and then by exurbia, and then ringed by terribly prosperous agriculture, or terribly poor-maintenance agriculture, will disappear. And we will be able to include rural areas in a wider complex, so we won't have the dreadful contrasts between the very poor-subsistence rural life, which has no possibility except sheer escape on a bus to New York, San Francisco, or Chicago, and what we call urban life today.

Unless we can think of them all at once, think of the welfare program of this problem of this country as a national problem, so that we don't have the rush of people from debilitated rural areas into the cities and into cities which have no relationship to them regionally—unless we can do this, we will have the horrible deterioration of both the rural areas and the urban areas that have been outdated, because we don't need those crowds of people around the gates of a nonexistent factory anymore.

Mr. Hansen. I assume from your comment that one of the first places to start is back in the rural areas.

Dr. Mead. Back in the rural areas, exactly.

Mr. Hansen. Let me ask one further question relative to the implementation of the grants anticipated by this bill. It is my understanding that you were involved in the development of a system of handling so-called minigrants, the acorn program in the Department of Justice.

Do you think that format might fit this bill?

Dr. Mead. I think it is very lively and very stimulating. I think that a minimal amount of structuring is in order. But the way we have got Government grants set up at present, you take 2 months off to write the proposal for the grant. We are using up more valuable research and innovative time in writing grants in this country instead of working on the grants. This is true the larger the grant gets, the more necessary it is to have these large proposals.

Also, they get concentrated in the hands of people who know how to write them. And so even for a minigrant sometimes you get a book by people who have enough money to pay people to write the books.

Now, if we could simplify this, and especially if you want to get different kinds and sizes of communities into this, and different community forces, I think minigrants where people could just take off on small experiments would be very useful.

With the environment, there are so many things you can do. You can start work right from your backyard or your block, test the air in your own street, or work on the lead in the paint on the walls in the old tenement right where you are. And it is not necessary to work on a world scale, especially for the children and the local citizen to find out what it is all about. In the end, you are working toward establishing a sound, informed citizen backing for the necessary steps that have to be taken by the Nation and the world community. And I think minigrants, with a minimum amount of redtape and professional expertise and jargon, are one way of approaching this.

Mr. Hansen. If we considered amending this bill to limiting the grant application to one page, it would be a step in the right direction.

Dr. Mead. Yes, but I wouldn't want to interfere with an individual's right to write long reports like that.

Mr. **Brademas.** I want to put one more question to you, because I am familiar with your work in the World Council of Churches.

Do you have any comment to make on the role that churches might be playing with respect to the whole environmental crisis? I have raised this, obviously, because of your earlier comment on the importance of attitudes.

Dr. **Mead.** Well, we are very hopeful that the churches will supply one of the principal ethical impetuses to what needs to be done. The World Council of Churches in the period before 1968 spent a great deal of time discussing such problems as man's economic organization for fairness and justice in the world. And for the next 7 years the group on church and society are working particularly with the place of man in a future oriented technology-based society, in which technology is a necessary component, and the relationship of that technological progress to man's spiritual and human welfare. That must be taken into account.

There are some quite serious problems involved, because in many of the orthodox positions, technology has simply been regarded as a simple enemy of spiritual life. Any tool invented before the birth of Christ was regarded as good and appropriate for a figure of speech in the sermon, the sail and the plough, and things like that. Anything invented since then has been regarded as the devil, with the computer now leading in this field. We have a dangerous break in society between those who feel man's spiritual life is permanently endangered either by technological advances as a whole or by the kind of thing Mr. Scheuer was talking about, where we spend our lives getting new kinds of hair dryers and electric toothbrushes and two five-passenger cars.

What we are trying to do is bring the two things together, to bring together the churches concerned for human welfare, bring together the churches and the synagogues to involvement in man's relationship to man and man's relationship to nature, and responsible attitudes toward technology, so instead of having either a kind of humanistic or spiritual battle with, or avoidance of technology, we will take responsibility of what we do with technology. We will recognize that the Sabbath was made for man and not man for the Sabbath, and that we are letting technology take the lead in many cases instead of the value of human beings taking the lead.

One of the interesting developments here has been the reinterpretation of the phrase of man "being given dominion over the earth," as it has been recognized. That has too often been interpreted as the right to exploit it, and we need to include the older image of man as being responsible for the earth and all the living things thereon.

Also, in terms of ecumenical movements, this is one of the areas in which you can get cooperation, and it is in fact one of the active areas in which there is active cooperation going on now between the Vatican and the World Council of Churches. We will have no more purely Roman Catholic or purely Protestant commissions in this whole field. They are going to work together from now on. And, of course, with greater understanding with the Far East and with other countries, we need an enlarged spiritual evaluation on man in nature and man's responsibility for this earth on which he lives, and the relationship of man to man within this environment that surrounds us.

Now, the churches are one of our enormous resources. They, to begin with, have a certain degree of humanity in that they include young and old and both sexes within their bounds. And they are working hard to include all races and all classes. You have a great uproar going on in the churches today, where people want to be more relevant, want to find things to care for, and where there is a great deal of experimentation of man's relationship to the whole natural world.

So I think the churches should be one of the principal ethical energizing resources for what we want to do in this environmental field.

Mr. **Brademas.** Dr. Mead, you have been, not to our surprise, informative, provocative, and indeed eloquent. And we are grateful to you for having come to be with us this morning.

Thank you very much.

Mr. **Scheuer.** I want to add to that, Dr. Mead.

We have been troubled by the generation gap. But you as an articulate American have helped us to bridge that gap, and we thank you for your help.

Mr. **Brademas.** Our final witness today is Dr. John Steinhart, director of the Marine Center at the University of Wisconsin. He is coauthor of the report "Universities and Environmental Quality" for the President's Environmental Quality Council.

STATEMENT OF DR. JOHN S. STEINHART, PROFESSOR, INSTITUTE OF ENVIRONMENTAL STUDIES, UNIVERSITY OF WISCONSIN

Mr. **Brademas.** Dr. Steinhart, we are pleased to have you with us here this morning, sir, and invite you to go ahead.

Dr. **Steinhart.** Mr. Chairman: On the week of April 22 the people of Madison, Wis., will stage an environmental week. Plans involve all segments of our local society—from chamber of commerce groups to high school students, and from rich to poor. Prominent figures from the national scene will speak and participate in panels. Demonstrations will doubtlessly take place, including not only the youths of the university, but children and middle-aged citizens of all political persuasions and from all economic strata.

Such scenes will be repeated across the country and remind us once again of the depth of feeling and imminence of concern about our environmental problems. Because this feeling has now become widespread and because it is shared by the members of Congress and particularly the members of this subcommittee considering H.R. 14753, I do not intend to give a catalogue listing of our environmental problems.

It will take serious and stringent efforts by all elements of society—government at all levels, citizens groups, industry and labor, educational institutions and individual citizens—if we are to halt and reverse the trends of environmental degradation and restore the search for human dignity, meaning, and satisfaction to the center of our lives. Of crucial importance to these efforts to solve our environmental problems are the educational efforts needed to inform all elements of society of the nature of these problems, their order of priority and such solutions to individual problems.

I will talk primarily about the role of higher education, not because it is the only important role, but because it is the one about which I know the most.

Conceptually there are three tasks in searching for solutions to our environmental problems:

First, we must seek a better understanding in detail and in the broad general sense so that we understand not only the technical details, but how various problems are interrelated and solutions therefore dependent one upon the other.

Second, we must search for particular and general solutions—whether technical ones, statutory ones, or social solutions are indicated.

And, finally, we must encourage forward the discussion of our collective and individual goals for our society so that the search for environmental quality does not become a collection of prohibitions but includes in it such general goals for a better quality of life as are common to all Americans.

It is in the third task, however, where the colleges and universities of the Nation may play the most important and perhaps crucial role in dealing with our environmental problems. The environmental concerns go far beyond the mere wish to remove irritants from our surroundings. Feelings about the degradation of life and dehumanization of individual occupations will not disappear even if water pollution and air pollution are suddenly terminated or brought to an acceptable minimum.

We must stop inquiring at some time where our blind devotion to a century-old attitude of unbridled growth and exploitation are leading us and inquire instead where it is we wish to go and what kind of lives we wish to lead.

The President almost a year ago appointed a commission on national goals. Such a commission is itself a recognition that we do not possess, at present, a clear idea of the common goals of all Americans nor do we possess any positive programs that will lead us there.

But I submit that national goals are not arrived at by Presidential commissions, but by widespread discussion openly held across the nation. Colleges and universities are so spread across the Nation in small towns and large cities and have a tradition of conducting just such discussions and, in the case of land-grant colleges like the University of Wisconsin, also a tradition of including citizens from all parts of society in these discussions through extension services and other direct participation.

I suggest that the bill currently under consideration could be an important piece of legislation in urging this discussion onward so that after a period of such free discussion of our common goals in society it may be easier for the Federal Government as well as government at other levels to select those common purposes which should become part of our political aims.

Unfortunately, this discussion does not proceed very rapidly at present. Our universities are badly in need of change and reorganization. I am told that Congress is similarly in need of reorganization and that such a reorganization, in the Congress, confronts considerable difficulty.

If it is difficult to reorganize the Congress, it is at least as difficult to reorganize the purposes of the universities. They are bound by tradition and devoted to the narrow technical expertise presently represented by—and I am afraid embalmed in—the narrow disciplinary departments.

Warren Bennis remarked in a recent article that a university was "harder to reorganize than a cemetery." As a man who has tried for change from the position of vice president of a major university, Dr. Bennis was expressing just the frustration I have alluded to.

Those at universities who are anxious to get on with difficult multidisciplinary problems, like those related to the environment, need the help of Congress, and need bills like this one to make available to them funds that will help break through some of the traditional rigidity and enable those who wish to, to get on with solving our present-day problems.

Let me raise one or two questions which it seems to me are of crucial importance and yet find no place in the usual college or university structures:

With rapidly expanding technology, we know that each new advance brings with it certain side effects, some desirable, some undesirable, and some unpredictable. Considering all these side effects and the rapid rate of change, are things getting better or getting worse?

The finite size of our resource base and our planetary environment have begun to concern us. Are these problems and challenges qualitatively different from what they have been in the past?

Most of the environmental questions confronting our society contain in them complex technical considerations—although not necessarily narrow specialist ones. Is it possible to have a free society or even a representative society when large portions of the citizenry do not understand the technical issues, and, considering the rate of change, are not very likely to in the future?

This list could be expanded endlessly, but I think the point is clear. New kinds of questions ought to be asked and ought to be at the central focus of educational programs. I assert that at present they are not.

I urge this committee to pass this bill and either in the bill or in the instructions to the granting agencies to look carefully at applicants for moneys appropriated to ascertain whether the applicants have a commitment to working on these problems or simply wish to acquire moneys to do what they have been doing all along.

Last year, at the request of the President's Environmental Quality Council, I participated in an investigation of environmental-quality programs at universities. My associate was an undergraduate from the University of California. Our report was published in September of 1969, entitled "The Universities and Environmental Quality." In that document we stated our findings that there were indeed a wide variety of college and university teachers prepared to move in new directions but hampered by the lack of Federal funds and by the conservatism and traditional resistance of their own institutions.

Speaking now in behalf of the group at the University of Wisconsin, I can say that with the help of administrators in our own university and the interested members of the faculty, we can solve the second problem if you can help us solve the first.

I urge that this bill be passed and that the fund-granting agencies under this bill look carefully at the commitment of both administrators and faculties who apply under the titles of this bill, to see indeed whether they are this new kind of teacher that is needed—one as willing to learn as to teach and one clearly devoted to solution of society's problems, whether or not all aspects of the problems fall within his particular traditional disciplinary focus.

It is important to inquire whether we are dealing with people who are merely seeking funds to do what they have been doing all along.

The content of environmental education—and I grow increasingly uncomfortable with that term—is not at all clear at this time. We are in desperate need of ecologists in the sense of ecology as a discipline, but we need many other things as well. The root of many of our problems is in technological side effects, or for that matter, in our longtime devotion to unbridled growth of consumer goods, of consumption, and of population. We should not, therefore, devote all our efforts to producing more scientific ecologists. We shall need social change and new kinds of government regulations and structures.

Garrett Hardin, over a year ago, illustrated very clearly that some of our problems, in particular population growth, not only do not have technological solutions but cannot have technological solutions. This leaves only the option of social change and government regulation for whole classes of problems. A part of the educational process will need to be the communication of this fact and that we cannot sit around, Micawber-like, waiting "for something to turn up."

Finally, gentlemen, we need the open discussion of alternatives for our future. We have already begun a period of rapid social change. The report of the young Republican Congressman visiting college campuses a year ago or simple observation of a college campus, or reports of young people's activities in the newspapers can persuade us that this is so. This odd behavior and the strange culture among our young people is not the result of some massive biological mutation, but a response to the very real problems and dissatisfactions which in somewhat more muted ways trouble us all. The kind of open discussion of future alternatives in the way we live with ourselves and with our environment is bound to make some of us uneasy. Those of us over 30 or 35 are likely to be most uneasy of all when longstanding ideas and goals of our society are challenged—and I am told that a majority of Congress is over 30.

Nevertheless, I think we can join in the effort to put the idea of man back where it once stood, at the focus of our lives and in the words of Archibald McLeish, "to make the end of education the preparation of men to be men, and so to restore to mankind—and above all to this nation of mankind—the conception of humanity with which humanity can live."

Thank you for your patience.

Mr. BRADEMAS. Thank you very much, Dr. Steinhart, for a most helpful statement. I am going to ask unanimous consent, which I think will not be challenged, that your report, "The Universities and Environmental Quality," be included as part of the hearings.

(The document follows:)

The Universities and Environmental Quality—Commitment to Problem Focused Education A Report to the President's Environmental Quality Council by John S. Steinhart and Stacie Cherniack, Office of Science and Technology, Executive Office of the President, September 1969

FOREWORD

The colleges and universities of the United States have contributed in many ways to the growth of our country and the solutions of its problems. Through the Land Grant College Act, Schools of Agriculture and Engineering, Schools of Public Health and the recent Sea Grant College Program we have found ways in this country to utilize our colleges and universities in realizing our national aims that are different from those found elsewhere in the world. The report concludes that there are many at the colleges and universities, both faculty and students, prepared to devote their efforts to the solution of the complex problems of environmental quality. I feel certain that this is the case. The question then becomes, in what way can we encourage them to join with the Federal Government and the society at large in seeking solutions to these problems?

While studying the existing programs described in the report the authors had an extensive discussion with students as well as faculty and administrators. The enthusiasm of the student participants is particularly interesting and suggests that there are many among the student generation who can employ their concerns about the future of our society in useful ways in programs of the sort described. One of the authors of the report is herself a student and the report illustrates the serious and cogent work such young people will do if given an opportunity.

I find particularly interesting the suggestions of interaction between universities and the Federal Agencies in a common goal to improve the quality of our environment. The importance of the goal recommends serious consideration of the report by everyone.

Lee A. DuBridge,
Executive Secretary, Environmental Quality Council.

HIGHLIGHTS AND RECOMMENDATIONS

Concern for the serious and complex problems of environmental degradation is constantly growing. All elements of our society share these apprehensions about the future. At the same time our national wealth, resources, and technological abilities should permit the nation to choose from an incredible variety of future options for the quality of our environment and the kind of life we live in it.

The colleges and universities of the nation constitute a powerful institutional resource for education, research and open discussion of our problems and opportunities. At present, except for the prophets of environmental disaster, little of this open discussion of our future environmental alternatives seems to take place at the colleges and universities. There is a national shortage of broadly trained professionals to deal with environmental problems. This report is a study of a few of the vigorous multidisciplinary programs at universities. The aim was to discover what kinds of programs have been tried, which ones have been successful, and how the federal government might encourage the promising efforts.

Extensive discussions were held with faculty students, administrators and interested people from outside universities about multidisciplinary environmental programs. Detailed on-site studies were made of six programs. We found that there do exist some very exciting and promising programs. Many of these programs face opposition within the university and all lack a suitable funding mechanism. We conclude that *two features are essential for such problem focused program to be successful*, (although they alone cannot guarantee success):

1. *Substantial or complete control of the faculty reward structure* and
2. *Freedom to be innovative in introducing course material, educational programs, work study programs, and curriculum requirements for degrees.*

We found the student participants in these programs to be enthusiastic and absorbed in their work. An unexpected finding was that more than half the students in such problem focused programs have held jobs for some years and have returned to the university to seek out these multidisciplinary programs because their earlier university education did not satisfy their requirements. It is our feeling that problem focused programs of the sort we examined provide the opportunity many students seek for an education relevant to society's problems, yet thoroughly professional.

We found that federal funds being expended at universities for environmental problems do not encourage problem focused multidisciplinary education and may even discourage the establishment of such programs. The appendix reviews the history of federal funding of interdisciplinary programs and we have concluded that new directions are required.

We have therefore recommended that the Federal Government assist in the formation at colleges and universities of Schools of the Human Environment answering the above criteria. Their common purpose should be problem focused education and research directed toward people's need and desire for satisfying life in pleasant surroundings. The historical example of schools of agriculture and schools of public health illustrate that such efforts are far from unprecedented. Initially such a program would cost approximately twenty million dollars, some of which could be transferred from existing programs. We recommend further that initial funding be done by an ad hoc group drawn from the interested mission agencies and the National Science Foundation and operate under the policy guidance of the President's Environmental Quality Council.

Introduction

We, as individual people, are immersed in our environment. We can change it but we can never escape it. We perceive it most often as physical and biological surroundings and, somewhat less well, as cultural and social surroundings. The growing public concern about the degradation of our physical environment and the hazards to our biological environment is obvious and will not be detailed further. Prophets of environmental disaster on every hand are quite ready to conduct us collectively or individually through a house of horrors of possibilities for the immediate or not very distant future. Many of the outcries of the young and of the minority groups relate to the environment and the quality of life as compared with what these groups intuitively feel are the possibilities for this country at this time. That the concern is much more widespread can be ascertained from the response of the stable middle part of society to such issues as the Santa Barbara oil spill, transportation of dangerous materials, or the use of pesticides.

A very serious risk is that we may follow some few of the traditionally-minded engineers and equate environmental quality with pollution abatement. If pollution were brought under control and clean air and clean water became a reality it is doubtful that the malaise about the quality of life would disappear. In any case, a program based only upon taboos—a program stating that "thou shalt not pollute"—has very limited appeal among all the alternative futures that may possibly await us. We have intervened in the environment whether we wished to or not and our only real hopes lie in deciding how it is we wish to live and inquiring whether we can achieve it or not.

The case is summarized by Hans Gaffron, one of America's leading biologists, in a recent statement. "This restless urge to mold a world according to his, unfortunately quite limited, imagination—this force has pushed man himself into a corner from which he must now try to liberate himself. At the moment it looks as if stupidity and meanness, combined with the forces of technology, are going to win the race towards cultural extermination before reason has had a good chance to discover the best way to reverse the trend."

To end and reverse the degradation of our physical and biological environment, to identify the alternative future options open to our society, and to define the common elements of the kind of life to which our society aspires will require strenuous efforts by all the people and institutions of the American society. This report is a brief but intensive study of the contributions that can be made by one of these institutions—the colleges and universities of the United States.

Education has always played a central role in the American dream, and the many and varied uses we have made of our universities illustrate society's faith in education. Of all subjects, it is easiest to get firm and solid opinions concerning the education of the young from all members of society. It should be noted that within the next few years more than fifty percent of the nation's young people will attend colleges and universities at some time. If we are truly concerned about the quality of environment and quality of life this concern must be illustrated and participated in by our educational system.

It is patently obvious, but bears repeating, that the problems and opportunities related to our environment in a growing and increasingly technological society are multidisciplinary as viewed from the traditional dissection of knowledge, engineering, and action into academic disciplines. Many of our most serious problems have arisen because narrowly conceived technological improvements have failed to take account of side effects, deleterious or otherwise, which inevitably accompany a widespread technological change in society. The question then, for universities, is how to pursue multidisciplinary education, multidisciplinary research, and a wide ranging discussion of our human problems irrespective of disciplinary boundaries or professional descriptions. In a way, the use of the word "multidisciplinary" betrays the history of the problem. We are talking about the approach to and the solution for problems and not about the scientific disciplines which can bring to the problem some important knowledge or evidence.

Problem Focused Activity at Universities

In popular discussion of how to solve our environmental problems, the space program or, less frequently, the success of our efforts to solve technical problems during World War II are cited as models. For the universities neither of these examples is particularly relevant; the World War II efforts were conducted under a suspension of the university "rules" in which everything was put aside in favor of this consuming effort with the idea that normalcy would return when the war was finished, as indeed it did for the most part. The space program has been primarily an effort of the Federal Government and industry with important, although modest, contributions from the universities. More appropriate examples of ways that universities may contribute to the solution of society's problems may be found in the areas of agriculture and public health. Although these problems are somewhat simpler than the complex problems surrounding the environment and the quality of life, these efforts, persisting for fifty to one hundred years, are more nearly comparable to the kinds of problems we face in environmental quality. The schools of agriculture, established under the Land Grant College Act of 1862, have been successful in terms of their original purpose beyond anyone's wildest dreams. The schools of agriculture together with the agricultural experiment stations and the county agricultural agent program have increased agricultural productivity to the point where it, too, is a problem. The gains in public health to which the university schools of public health and medicine made important contributions are too well known to require recapitulation. What is perhaps most impressive is that these units of universities have always had reputations of being second rate intellectual efforts and, like all prophecies, repetition of such statements is self-fulfilling. That they succeeded in spite of this is a remarkable accomplishment. The common feature of both of these efforts is that they are problem focused.

It will not be easy to begin new problem focused programs at universities, despite the need for trained professionals and the seriousness of the problems. Dr. J. Kenneth Hare, Professor of Geography at the University of Toronto and former President of the University of British Columbia, commented on these difficulties in an open letter:

"Let me start, then, with the question of environmental studies in a modern University. We all know the conservative quality of such places, where nothing can easily be done for either the first or the last time. The *status quo* is defended in depth by the vested interests of a large number of able people. Among these interests are those of the traditional departments and the largely analytical disciplines they profess. Also strong are the numerous special institutes and centers that have got started in spite of the resistance of the departments. When we propose to start up a broad-spectrum, synthesizing effort like environmental studies we run full-tilt into these vested interests.

"We also bang ourselves against the clan-spirit of the traditional faculty groupings. Humanists, social scientists, natural scientists, and professionals like lawyers and engineers may fight like cats within the clan, but they close ranks and hitch up their kilts when someone questions their loyalties. Environmental studies have to involve many of these clans, which are not used to combining in the way required. If we suggest, as I do, that some of them—notably the humanists—may be utterly transformed by such combinations we alarm the timid and anger the Tories among them.

"But the greatest hazard in our path is inherent in Lyndon Johnson's acid query 'Therefore, what?' which he threw at a group of professors who had just briefed him on the Middle Eastern situation. The political interest in the environment demands proposals for *action*—on all time scales, from the immediate assault on pollution problems and other festering sores of today, to the long-term reconstruction of society in a better relation with environment. At present we are not equipped to make such proposals. We are not action-oriented, and on every campus there is a dead-weight of opinion that regards action-oriented programs as hostile to the academic life. . . .

"It must also stress the incompetence of the established disciplines to tackle society's real problem. What we mean by a discipline is an agreed tested body of method—usually analytical—that we bring to bear on problems *of our own choosing*. The essence of our thinking is that we cannot tackle problems that don't fit the competence of our own discipline. It's true that we constantly try to enlarge that competence. Confronted with a new problem, we spare no effort to improve our methods. But if we don't succeed, we don't tackle the problem, and we tend to condemn colleagues who try."

THE DESIGN OF THE STUDY

What has been tried?

It is not the function of the Federal Government to order the universities to undertake specific programs. It is idle to pretend, however, that federal funding policies do not play a very large role in what happens, and equally, what does not happen at universities. The response to various funding programs of the government in defense, space and a variety of other areas have caused universities to erect a wide variety of institutes, centers, and programs to respond to the available funds. In most cases these institutes have been largely paper structures and their impact on the universities and, especially, on the students and the public discussion of the issues surrounding the work has been negligible. Curriculum, faculty rewards, and most of the research has been controlled within the departments representing the narrow academic disciplines. These departments grow narrower and more numerous year by year as the advance of modern science results in increasing specialization. These institutes and centers contrast strongly with the history of agriculture and public health in which curriculum, faculty, and research were centered in schools that were nearly autonomous.

This study set out to examine the range of institutional arrangements that have been tried in dealing with environmental problems and to determine, as nearly as possible, which kinds of arrangements have proven to be successful. We return at the end of the report to inquire how the government funding policies effect university work in the environmental area. It is important that funds made available to work on environmental quality problems be supportive of those efforts likely to result in success, and equally important that they are not wasted on the kinds of efforts that have already proven to be unsuccessful. The urgent and long term needs to examine the quality of our environment and identify what alternative futures may be open to us suggest that a vigorous program comparable in vision to the Land Grant College Act would be extremely important if there were any chance whatever of success.

Society, through its government, does not deal in academic disciplines. It deals in problems and opportunities. Society has a right to expect, as a part of the educational process, discussion of the prominent issues, problems and opportunities of the day, and training of professionals who can deal with these problems on a professional level. A second function of the universities is a prominent role in the long range public discussion of alternative futures. Many of our government policies, now commonplace, have originated in academic discussions of an earlier generation. Yet, except for the doomsayers, discussion of possible future environments among the world's academic community is surprisingly muted. We do not have offered to us the variety of alternatives which may be possible, and from which society and its elected representatives can select pieces to become part of our policy and national goals. The recent establishment of the President's Committee on National Goals is, in part, a recognition of this shortcoming. The increasing concern of the younger generation for the future quality of life in America suggests that the universities could play a very important, perhaps even a crucial part in such a wide ranging public discussion. Thus we certainly ought to inquire as to whether Federal funding policies could encourage this discusion forward and as a minimum ask that Federal funding policies do not discourage such discussion.

Criteria for evaluation

What is it we expect of universities? Can education be all things to all people? How can one maintain rigorous standards? The universities can never respond to a crisis! An interdisciplinary education will sacrifice rigor! These questions and statements, whether from faculty, students, or ordinary citizens, commonly occur. Rather than try to answer them on intuitive grounds we set out to examine some institutions with on-going programs related to the environment and of multidisciplinary content to inquire how well they have worked.

It became obvious early in the study that *two criteria* were of significant interest when examining the on-going programs related to the environment:

(1) *The degree to which the program, center or other structure participated in the faculty reward structure—including appointment of faculty, promotion, salary, tenure, and other benefits afforded faculty members.*

(2) *The degree to which the program, center, or whatever participated in the generation of curricula, degree requirements and new or innovative approaches to education for these multidisciplinary problems.*

If a program had no influence over either of these areas we found it to be ineffective and powerless within the university. Its contribution to education and public discussion was very limited even though significant research might have been done by faculty members. We also examined the relationship of such programs to real world problems (through work-study programs or other mechanisms) and the degree of participation by students educationally, in research, and in the formulation of policy for the program.

One further word about students is in order. Unrest on the campus has been forcefully brought home to us by the newspapers and television, yet those of us beyond student age still have some difficulty in understanding exactly what is happening on the university campuses. The problem is a complex one, but the following comment by the twenty-two Republican Congressmen who visited fifty campuses during the spring of 1969 briefly summarizes the nature of the problem:

"We came away from our campus tour both alarmed and encouraged. We were alarmed to discover that this problem is far deeper and far more urgent than most realize, and that it goes far beyond the efforts of organized revolutionaries. . . . Too often, however, we saw their idealism and concern vented in aimless or destructive ways."

No reasonable man countenances violence. Nevertheless, direct attempts to suppress violence are dealing with symptoms, not causes. Society must respond to the searching questions students are asking. Prominent among these are the concern about the environment and the quality of life. A concrete way that the government can express its agreement about the seriousness of environmental problems is to do what it can to encourage students to work on these problems. We certainly desperately need qualified professional people who can help us solve the serious problems besetting our physical environment. The Republican Congressmen again state:

"We found an encouraging desire on the part of many students to do something to help overcome the problems of our society. This dedication or commitment to help others is a hopeful, important area which should be encouraged."

In the discussion and recommendations that follow we have tried, by talking directly to students in environmental programs, to determine their reaction to these programs and to obtain some idea whether, in addition to being effective, these programs answer the deep and justifiable wish of the students to help in the solution of our problems.

Finally, we tried to examine the present participation of the government through its agencies or individuals in the interchange with the universities—faculty and students—in consideration of these environmental problems. The leavening effect of students and others participating in the government has been aptly demonstrated by the Executive Intern and White House Fellow programs. The contribution federal officials could make to the educational process of faculty and students at universities through brief participation there should not be overlooked, and the rejuvenation of a man from an operating agency worn down by long work on persistent and difficult problems should stimulate the agencies involved.

These are ambitious objectives for a brief study and we have not achieved them to our complete satisfaction. Nevertheless, in what follows we think we have reached some important conclusions. We consider time of the essence; therefore we urge that prompt action be considered and that the problems simply not be studied to death.

Institutions for study

In order to examine more closely what has actually been tried at universities, we first attempted to ascertain which institutions had innovative programs. In this effort we were helped by a variety of people, but particular thanks are due to Mr. Richard Carpenter of the Legislative Reference Service who, with the kind agreement of Congressman Emilio Q. Daddario, made available to us the results of a mail survey of over two thousand colleges and universities in the United States. Of the large number of returns received from this questionnaire relating to programs in the environment, we examined about two hundred in detail which had been selected by the Legislative Reference Service as having some program or plans. This screening process enabled us to be reasonably certain that we had not neglected some very exciting and unusual programs. Subsequently we talked to faculty and/or administrators in multidisciplinary programs in more than thirty universities. Some of these programs and their institutional arrangements were quite interesting and almost all have their own special features.

We made site visits to the six universities for which reports are submitted as appendices. We do not feel that a large number of site visits would have substantially changed our conclusions at this time. In addition, we have talked at length with various offcials of the Federal Government concerned with multidisciplinary programs including representatives of the National Science Foundation, the National Institutes of Health—Public Health Service, National Aeronautics and Space Administration, and the Department of Defense. We have talked with and received opinions from a variety of other non-government people, including representatives of the National Student Association, the Ford Foundation, RAND, the National Council on Education, and the Conservation Foundation. The opinions expresed by these many individuals and the written material which they have sent us have contributed to the formulation of our conclusions and ideas.

RESULTS OF THE STUDY

Institutional arrangements

At almost every university and at most colleges there is an incredible number and variety of interdisciplinary institutes, centers, and programs on almost every subject of human interest. At one major university we counted 157 such free-standing institutes and centers, and at another major university 126. While the rosters of these institutes and centers are frequently impressive, in reality they most often focus around one or two men with an idea and an interest which gave birth to the center. Most of these institutes and centers have in common that they satisfy neither one of the criteria mentioned above—that is, they have no influence over the faculty reward structure and little or no influence over curriculum. Research done under the auspices of institutes or centers is most frequently done within existing departments and it is only the sum of research that is interdisciplinary because each individual project is divided into the disciplines and pursued independently. This widespread pervasive experience with the "paste-on" institutes is unimpressive, and it is clear that this kind of institutional arrangement simply does not work at universities if one wishes to educate new professionals, to involve students with the topical material, and to have free-ranging discussion across disciplinary boundries take place.

Of the six programs we examined in detail, two of them had their origins in city planning and urban studies efforts, two of them had their origins in sanitary engineering and, to a lesser degree, civil engineering, one originated from a combination of biology, engineering and public health interests, and one grew from diverse sources mostly in engineering. These programs having their origins in engineering still exhibited a strong attachment to the engineering schools and had as their principal features strong science and engineering together with operations research and systems analysis efforts. Programs originating in urban studies contained a much larger element of social science involvement extending well beyond economics into psychology, sociology, and other areas. Several of the programs were connected with schools of public health and medical schools, although in most cases this is a somewhat uneasy relationship at present and no professional medical people seem to be directly involved with the program on a continuing basis. There were minor contributions to some programs from professional schools of public administration, law, and industrial relations. Most of the program leaders hoped for further involvement and indicated some enthusiasm on the part of the professional schools. Lack of funds was most often cited as the reason that the arrangements had not proceeded further. A disturbing note was the lack of humanists with these programs. Since perception of our environment is dependent so strongly on our ideas of æsthetics, social aspirations, and beliefs, it seems important that humanists be involved in consideration of the environment. Again, many program directors felt this need and hoped to add humanists at a later date. Particularly when other countries are considered, it is essential that humanists be involved because foreign cultures frequently do not regard their environment in the same way that Western cultures do.

The formal institutional structures of these six programs differed considerably: one was a Center, one an Institute, one was a Program, one was a Department, one had no name but was centered around a department, and the least effective one had no name but included a center and involved members of several departments. What all of the effective programs shared were the two features mentioned above; they had substantial influence or complete control over faculty hiring and subsequent promotion and rewards, and considerable flexibility in introducing new course work and curricula, and flexible degree programs for students working in the problem areas. In most cases they also had the direct interest of one of the more senior administrators of the university who frequently had helped foster the program and who almost always helped to provide both resources and protection from traditionally minded faculty members.

It seemed obvious to us, and was mentioned by at least one of the program directors, that possession of their own resources and considerable influence in the faculty and curriculum areas made for a more harmonious relationship with the traditional departments and schools of the university. When the program was in competition for the scarce resources of the university, the traditional departments were frequently arrayed in opposition to the problem focused programs or institutes. The departments of the traditional disciplines did not actively support these programs. There were individual participants from the departments interested in and actively participating in the programs, sometimes with part of their salary paid by the program and sometimes not. But there was almost a sense of conspiracy among these participants as if problem oriented programs were somehow at odds with the purposes of their discipline departments.

The physical plant provided for most of these efforts, except for that one which was a department, were generally makeshift and somewhat inferior and frequently scattered widely over the university campus. This was noted as troublesome. As many of the program directors pointed out multidisciplinary efforts thrived best if the participants were in fact brought together on a regular basis so that they became accustomed to conversing with one another. One program at a major university had provided extensive quarters for its multidisciplinary effort but the program was sufficiently new that we did not elect to examine it in detail. No doubt the newness of the programs has, in some cases, prohibited any efforts to provide more suitable accommodation in some central location. That the programs remain as vigorous as they are without central accommodations is a tribute to the strength of the ideas and the vigor of the participants.

These programs and efforts are problem focused efforts as contrasted with the discipline and methodolgy focus of most university departments. This has deep and comprehensive implications for education, for faculty, and for the ultimate goals of the educational institutions themselves. It is a mistake, however, to think that they are unprecedented. We have already cited as examples the schools of public health and the schools of agriculture. There are other analogies to be drawn to the professional schools of business, medicine, and law. At the universities we examined, the programs focused on a broad range of environmental matters, but within this general framework—somewhat vague and all-embracing—centers of intellectual activity grew up around the interests and abilities of the people who were there. This is appropriate and it would be a mistake to try and mold all these institutions toward some particular purpose. Any hope of eventual success in solving our problems in environmental quality requires a great variety of specific problem focus, style of activity. The institutions at which such efforts are mounted may require somewhat different specific institutional arrangements. We came to conclude only that problem focused efforts have an appropriate place in education, that the places we visited were vigorous and promising, and that the two criteria mentioned above are *essential* for any hope of success even though they cannot guarantee it.

In the course of our study we had an opportunity to examine a report by Eric Jantsch of the OECD entitled "The Emerging Role the University." This study was prepared during a year-long stay at the Massachusetts Institute of Technology and represents considerable study and conversation about the future of American universities. We found this study to be particularly thought-provoking and agree with many of its conclusions. In terms of institutional arrangements, the following comments by Jantsch are indicative of what we felt to reflect the motivation and aims of the best programs we have seen in operation:

"We are living in a world of change, voluntary change as well as change brought about by mounting pressures outside our control. Gradually, we are learning to distinguish between them. We engineer change voluntarily by pursuing growth targets along lines of policy and action which tend to rigidify and thereby preserve the structures inherent in our social systems and their institutions We do not, in general, really try to change the systems themselves. However, the very nature of our conservative, linear action for change puts increasing pressure for structural change on the systems, and in particular, on institutional patterns.

"We are baffled by the sudden appearance of such pressures for change in the educational system, by student unrest, and by the notion that the current type of education may no longer be relevant. We are confused by the degrading side-effects of technology on the systems of human living, in the cities as well as within the natural environment. And we are ridden with doubts about the effectiveness of decisionmaking processes dominated by short-range and linear thinking and about the piecemeal and passive way in which scientists and engineers respond to them. Through its three functions—education, research, and service—the university is deeply affected by all of these pressures for change. To live with them, to absorb them and even make use of them, requires a new purpose and a new structure for the university.

"Throughout this paper, the belief is held and substantiated that the disruptive forces threatening the university—and, indeed, society itself—may be expected to act as cohesive forces once a number of structural changes have been introduced, both within the university and in its relationships with society at large and with the various elements of the surrounding community.

"It is necessary to deal with causes, not with symptoms. The general concern over the university, and above all the students' concern cannot be resolved with patchwork and compromising, shock-absorbing strategies. These are no clear-cut problems to be solved—the classical single-track and sequential problem-solving approach itself becomes meaningless today. This may come as a cultural shock to our pragmatic and efficient society, valuing nothing higher than 'know-how'."

Faculty

We talked to a great many faculty members at the six universities we visited and a good many others in Washington. It became obvious that there was a fundamental difference in career goals between those associated with problem oriented programs and the more traditional faculty devoted to disciplines. One man with particular technical preparation may choose to devote himself to the uncovering of new knowledge in the traditional academic mold and the improvement of his discipline while another man with precisely the same preparation may devote himself to a broad problem area. This difference of attitude is institutionalized in a traditional academic department so that, even though individual members may have interests in problem areas, the sum of the department has a strong vested interest in preserving the study of the discipline, the improvement of methodology, and the pursuit of new knowledge wherever it may lead.

Basic research is not a continuous process but rather a continuous succession of choices. Will I follow this direction or some other direction? A problem focused man will take that direction which he expects, rightly or wrongly, will lead closer to the solution of problems in which he is interested, whereas the man devoted to the uncovering of new knowledge will take that direction which he finds most interesting. As scientific knowledge accumulates and academic disciplines fractionate into ever narrower professional specialities the institutionalized differences between these two fundamental attitudes become clearer and more irreconcilable than ever. Several faculty members we met emphasized this basic difference in career goals. When problem focused programs were clearly separated institutionally from those with discipline goals the faculties got along better, talked more freely together, and even worked together on some specific topics. The uneasy relationship which exists between the two goals is clear from hiring practices. If the chairman of a discipline oriented department is faced with the choice of two men, one with a problem focus and considerable experience, and the other with a narrow disciplinary orientation and much accomplishment in basic research in his specialty, the chairman will invariably choose the latter.

The traditional rewards of the academic profession have been most commonly given to those with a discipline orientation and perhaps this is appropriate. We found that the faculty with a problem focus were not especially concerned about this kind of academic standing and reward structure; but for obvious reasons they were conscious of the university reward structure including appointment, promotion, tenure, and salary levels. There may well be some men who would like to pursue both kinds of activity; however we are skeptical that either activity can survive unless it has a corps of dedicated people clearly identified with it and who recognize one or the other as their home base.

Many of the faculty members associated with these problem focused programs have had experience in government, in industry, or in other service activities. This contact seems especially valuable and ought to be encouraged by any such programs that are initiated. Outside people who came in as instructors from time to time seemed also to be useful. In one such program the mayor of a major city was coming to learn as well as teach in the program.

Those faculty associated with the problem focused programs numbered more engineers among their members than any other collection of professions, although there were biologists, physicians, economists and other social scientists, and a sprinkling of professional people such as lawyers in some programs. In our opinion most of these people were extremely able. Many of them are among the leaders in their field. In some cases this could be ascertained by their academic standing in their disciplines at the time they elected to engage more strongly in problem focused work. In other cases the evidences were practical ones. For example, one man was actively pursuing game theory as a method of discovering how different groups in the society thought government policy was made. The evidence of his ability in the field was that an incredible variety of city and local government agencies (and 26 foreign countries) have attempted to hire him as an advisor. He now has to decline most such invitations because he simply does not have time to pursue his own work nor his interests in educating his students. Other similar examples could be cited. The programs that had been going for some length of time seemed to attract considerable project support from industry and government at state and local levels. This is direct market place evidence of the success of these programs. It would be a mistake however to attempt to run programs permanently on specific project support if, as we believe, the society as a whole has an interest in the educational aspect and the free discussion aspect which are not served by the short term problem focus usually supported by industry and local governments.

Problem focused work is admittedly difficult. It requires multidisciplinary efforts or, as one student put it, "a disciplinary." A number of impediments were proposed to us from time to time by discipline oriented faculty. For example, it was suggested that faculty will work across disciplinary lines on projects if money is available. While it is true that in times of tight money supply faculty may look eagerly toward any moneys that are available, it is not true that one can simply bring members of different disciplines together and immediately expect successful joint efforts. The most successful efforts were among men who had spent some considerable time working together.

Those trained to different disciplines develop a collection of technical terms, ways of approaching problems, and analytical tools which differ more in description than in substance. In the most successful programs a common language had developed after some length of time. However the language problem was solved, it was not solved instantaneously by bringing together a variety of disciplines. After a core group has developed a common language it is much easier to bring in an occasional visitor from some relevant discipline who can, in effect, have the proceedings of the group translated for him until such time as he understands how they communicate with one another. The students who participate in such programs have less difficulty since they begin with a multidisciplinary approach.

Another common allegation was that the faculty would get out of date in such a program. There is some evidence that in the case of the schools of public health some faculty did fall behind the advances of relevant disciplinary fields. One cannot guarantee that this will not recur. We can only state that we found the participants in these environmental quality programs fully up to date with developments in the disciplines with which we were familiar. In areas such as systems research, game theory, and computer techniques the faculty were developing new methods. In any case, there is no reason why, given satisfactory institutional separation between the people dedicated to problem solving and those dedicated to basic research, a peaceful interaction cannot take place in which both groups stay up to date and are stimulated by each other. This kind of symbiotic relationship was developing at several of the institutions we visited.

Finally, several famous members of the scientific elite have suggested that there is not a supply of able people willing to engage in activities of this kind. We have simply not found this to be true. There are far more people willing to engage in this activity than can find support either to teach, do research, or work on problem focused activity related to environmental quality. It is interesting to note that we have received several unsolicietd resumes from young scientists at three of our leading universities who have heard of our summer study and wish to be brought to notice of these programs where they might secure jobs in the area. The resumes of these young men suggest that they are among the very brightest available from physics, molecular biology and other fields.

In summary the faculty seems well qualified. The supply is abundant for an expansion of ten times or a hundred times the present level of activity. What is lacking is an institutional willingness to try and, most of all, there is a shortage of money with which to start. We will return to this subject in the fiindings and recommendations.

Students

One of the myths, often repeated when discussing interdisciplinary programs, is that if students do not have the proper disciplinary training they will not be prepared for careers awaiting them in the "real world." The students with whom we spoke disagreed. As stated in the Cox report on the Columbia disturbances:

"The simple fact is that a constantly growing proportion of the best students does not look forward to careers molded along the established lines of professional or business success. The point can be proved statistically, but it is enough to illustrate it by reference to the tremendous interest and social service work in the Peace Corps and conversely to the difficulties established business firms and the professional advisors now face in recruiting."

The world to which the PhD student is headed is one concerned with problems, and not organized along disciplinary lines. There is a variety of jobs awaiting such a problem oriented student. For example, there are numerous government agencies currently faced with an alarming lack of trained individuals who can competently deal with problems of the environment, At best, we have managers trained in a discipline and with a tendency to view all problems that come under the auspices of their agencies in terms of that discipline. There will always be agencies and industries interested in hiring people to solve problems. The Vice Presidents for Research of major corporations told us that they desperately need people with broad training in the environment. What better source of manpower, than those who have trained for just this purpose?

It is even possible that this is a moot question. For more and more today, we find that students are less interested in the material values than their parents. We have spawned a generation with a "social conscience." Unlike their parents, this generation was raised without the devil of depression in constant watch. Many are not concerned with the security of a high paying job. Instead, they have found that what is most important to them is to divert the world from what they see as a path toward certain doom. That, in the student's view, the accepted academic disciplines have not met this need is evidenced by the findings of Dr. Benson Snyder, a psychiatrist at MIT. He has reported that a large fraction of the very brightest graduate students admitted to a scientific education either drop out or are much dissatisfied with education goals. From performance data and in-depth interviews he concludes that these are not only among the brightest students but constitute those with the greatest depth of concern about society's problems.

Society is tragically unconcerned about these students who choose to drop out, yet these students' motives are closely related to the causes of campus unrest about which society is so alarmed. We would do well to question the genesis of such unrest. The twenty-two Republican Congressmen did just this and came up with some surprising answers. They quoted one university student as saying. "Most of them (the faculty) hold to the ideal that the university is a neutral institution, devoted to objective truth. But the people who have power in America have pervaded this institution. The university could never be neutral in our present society. . . . The university ought to be a partisan of the progressive forces in society." The Congressmen went on to state as one of their findings:

"The student's view is an obvious departure from the generally held public view of a university as an isolated tower that transmits and enlarges knowledge in the process of preparing individuals for careers. This student's opinion requires that the university be relevant to our era and its problems, that it be committed to an active role as progressive force. What is important about this perspective is that it is expounded not by a minority of revolutionaries but by very large numbers of sincere and highly motivated young people."

They found that with each example of the university's inability to meet legitimate demands for change more and more students gravitated toward the radical students' point of view.

If the universities could overcome their innate conservatism by creating curricula which the students would find more relevant to the problems existing in the world outside the universities, then it is possible that a good deal of unrest on the campus would vanish. At least the students with a legitimate concern toward their education would find that the university would indeed allow them to go into fields of deep social concern. We found evidence of this at all the campuses we visited. Almost all the stdents with whom we spoke were products at the undergraduate level (and many at the Masters level) of a strict academic discipline. Each of them has expressed a degree of dissatisfaction with his narrow disciplinary training. They were enthusiastic about the programs in which they were participating and expressed concern at the lack of such programs at other colleges and universities in the United States. None of these students worried about future careers. In many instances they voiced the desire to teach at the university level in programs of this kind.

It is of particular interest that a majority of the students with whom we spoke had had some experience in the "real world." Some had returned to the university after as long as fifteen years. At one such university with a program in city and regional planning, a new PhD student this fall will be the former Model Cities director of the neighboring large city who will be entering the program at the age of 50. These experienced students expressed little concern over their future. They had been working on society's problems and had come back after a realization that they needed problem-oriented training. They felt, to a large extent, that their disciplinary training had been inadequate in preparing them to deal with problems outside the university.

In many cases students provide the cohesion for the group which the faculty are unable to contribute. The programs in which the students had a strong voice in direction and goals seemed to work the best. It was the students that were truly inter-disciplinary. With their problem oriented viewpoint they provide an important channel of communication between the participating faculty members. Because it is the students' goal to receive a true multidisciplinary, problem oriented education, they often demand there be a maximum amount of interaction between faculty and students and faculty among themselves.

It was only if the program functioned as a degree granting institution that the student gained the maximum benefit. The problems of such a Center when it existed only to supplement the student's education in an academic discipline were severe. The students at a large Western private school with an urban oriented program complained that oftentimes they were not able to devote the amount of time they wished to programs of their Institute. This was because many of them, especially the Masters students for whom no degree is granted, were required to take courses to satisfy the established curriculum of their discipline at the same time that they were participating in programs of the Institute. Because of the program's flexibility, which included lack of deadlines and examinations, the students were forced to devote more time to those courses required in their disciplines which have such deadlines. Any benefits from participation in such an Institute will almost certainly be negated if the student if the student is forced to place his work at the Institute at the end of his list of academic priorities.

Of the three major roles of the university—education, research, and the ongoing discussion of problems—it is certainly the education of students with problem oriented training which is one of the most valuable results of a program concerned with environmental quality. The fear that a student trained in such a program will be amateur rather than a professional is not echoed by the students themselves. These students, especially those with extended work experience, know that it is not necessarily true that a generalist equals an amateur. The students expressed confidence in themselves and in their ability to find jobs after they had completed their university education. They were excited about their programs.

Curriculum

There is strong evidence in our findings that the programs which have control over their curriculum are the most successful. The optimal arrangement is one in which the program or center offers a degree to its participating students. When this is the case students will not find it necessary to satisfy the academic requirements in a department in addition to any which may be attached to the program. Some of the programs did offer their own degrees. Others overcame the problem by making use of the committee or individually planned degree. Thus, the students were able to devote their time to interdisciplinary programs concerned with the environment.

An Environmental Quality Program should have a mechanism through which courses may be created and added to the curriculum of the students. It is neither necessary, nor desirable, that the students' entire curriculum be offered under the auspices of the program. We are, after all, looking for interdisciplinary programs and the students should take advantage of the wide range of courses offered throughout the university. However, it will not be entirely answered by those courses already in existence. Many of the programs offered core seminars as the basis upon which the student built his curriculum. In one case, these core semiars served as a meeting ground for interaction between students and faculty. There was no subject matter attached to the seminar until the faculty and students together decided what it should be. In all of the other programs students and faculty were free to create courses which they felt necessary for their education.

Whether or not a degree was offered, the students were allowed a wide range of freedom in deciding upon their curriculum within the programs. In the cases where degrees were offered, students were encouraged to tailormake their own curriculum, usually in conjunction with a faculty adviser. One student at a small eastern school commented that never in his educational experience did he feel, as he felt now, that his individual desires and talents were taken into consideration in formation of his degree program. It was at this same school that the students commented as a group on the absence of competition within the department. They explained that the range of problems dealing with the environment was so large that there was no reason for them to compete either for thesis topics or for jobs afterwards. They were excited by the individual freedom allowed them in the pursuit of their education.

As students often pointed out, absence of set requirements allowed them to take a wide range of courses throughout the university, thus giving them contact with the various disciplines. One student remarked that the value she found in taking courses in other disciplines was that she was learning how to communicate with those people still lodged in disciplines. In no case did we find students who felt themselves unable to compete in these disciplinary courses. It is through this contact that the students become truly interdisciplinary. Since they had become used to participating in courses across the academic spectrum, they had much less difficulty than the faculty attached to the programs in communicating across disciplinary lines.

There was some evidence that courses offered by such programs are taught differently from those offered in the traditional academic disciplines. Seminars and workshops were the common course structuring. But much more so than in the traditional disciplines, the seminars tended more toward group interaction and "T group" experiences. It was a feeling expressed many times by the students that they had little patience with faculty members who made rare appearances at the Center. To the extent that research was a part of their training the students welcomed it. But they stressed that they did not want a faculty member involved in the Center who was primarily interested in his own individual research and who spent most of his time on it. A faculty member heading an undergraduate program in the urban area at a western private university felt that the pressure on him was much more than he had experienced in any other academic situation. The students demanded that he be present sometimes just as a sounding board for their ideas. He felt that many faculty members had a fear of this interaction and thus shied away from participation in such vigorous programs.

In particular, the students should have some practical experience in working out the problems of the "real world." Whether it be in an urban semester program a work-study program, this is experience that will be invaluable to the student once he has finished his studies. The university will always, to a certain extent, be insulated from society outside its boundaries. Only through the instigation of such work-study programs will students be allowed the experience of actual problem solving.

THE ROLE OF FEDERAL FUNDING

In considering the role of federal funding in environmental quality programs it is important that the Federal Government, and specifically those agencies concerned with problems of the environment, not fall into the trap of funding disasters and withholding money from those programs with the greatest chances for success. A common complaint we heard at all the universities we visited was that there was a general lack of funds available for such wide ranging interdisciplinary programs. What the heads of most of these institutes found themselves doing was going through a process of genteel lying and cheating in order to get money for their programs. Often times, it was necessary to emasculate the programs in order to suit the specifications for federal funding.

We have not attempted a detailed study and analysis of the Federal Government's past efforts to fund interdisciplinary research and education. Such study has been made by Dr. D. E. Cunningham under the auspices of NASA. At our request, Dr. Cunningham agreed to summarize his findings for this report and his summary is attached as appendix 1. His findings have helped shape our conclusions and recommendations.

The most common method of funding is through individual research grants or project grants. What the Federal Government is in effect doing is encouraging the creation of "paper institutes." The money, usually in the form of project grants, is awarded to the institute and each professor quickly takes his share and returns to his department for his individual research. After a certain length of time the professor may be expected to return with a neat paper of research results. This can hardly be considered as a satisfactory model for interdisciplinary research, and there is certainly no provision for the training of qualified individuals who will deal with environment or for the on-going discussion of environmental problems. In essence, the funding patterns are not demanding of any commitment by the institutions. Any interdisciplinary work which exists today is largely a result of sheer will on the parts of the participating individuals.

Another result of such funding patterns is that there is a lack of continuity, of research and of training. Once the project has been completed the faculty members working on it disband the group and seek new funding for new projects. Thus, the faculty members receive an excellent training on how to fill out federal funding applications.

One myth which has been built into the system of federal funding is that research and training can be adequately separated. Especially in these interdisciplinary areas this is just not the case. There have been a few training grants for individual students who wish to pursue particular projects. But how can they be trained in the area of environmental quality if there is no one on the faculty of the university to train them? These training grants force the student to identify himself with a particular academic discipline and often times he is diverted from his original purpose and the purpose for which the training grant was awarded.

The funding patterns as they exist today do not seem to promote an interaction between the funding agencies and the universities—an interaction which could prove to be rewarding for both. The students could receive valuable experience through contacts and work with agency officials. Especially if a program is to be problem focused students should be exposed to the problems with which the Federal Government is faced. Further, many agency officials could benefit from the new ideas which come out of the interdisciplinary programs in environmental quality.

There is a broad need for programmatic support for these environmental quality programs. The Federal Government must attempt to select those programs which have the greatest chance of success. According to our findings, this would mean that the Federal Government should look for programs which have a strong hand in the faculty reward structure and over student curriculum. In addition, the agencies intending to do the funding would be wise to look for a strong administrator with some overall responsibility for the program. It is usually through the presence of such an administrator that the program has managed to establish itself within the university structure.

The Government could play an important role in the institution of these programs by contributing seed money for the hiring of faculty and for planning of new programs. Once the program has been in existence for a specified length of time this money could be replaced by money from the university. But money, which is so desperately needed for the institution of any such institute or program, will most likely have to come from the Federal Government since most universities cannot provide initial funding. If the program has a good faculty and a good plan of action, and if it can begin to attract students, then this is the recipe by which state and private sources will begin to divert money into the program.

It might also be wise for the Federal Government to establish some policy regarding educational innovations in such programs. Some educational money should be applied to these new interdisciplinary areas for experimentation with new methods of teaching and research. This would not be continuing funding but would provide for the preparation of new methods of teaching, course materials, and faculty free time to prepare innovations.

Student funding should not be ignored. The Federal Government and many industries are desperately in need of the people who will be trained by the program. It may well be that these people are as valuable to society as those in the medical sciences and perhaps are as valuable to society as those in the medical sciences and perhaps the Federal Government should provide similar incentives and support for them. One common thread we found among the students in all the programs was that a majority of them returned to these programs after an extended amount of time of outside professional experience. Many of them had wives and children and were giving up lucrative jobs in order to return to the university. The Federal Government should consider funding support for such people. Continuing and re-education of such experienced people is in the best interest of society. Currently the amount of money they receive on training grants cannot adequately support them and their families. We do not want to preselect out those people who have valuable experience to contribute to the program. This is, in effect, what is happening when we offer a graduate student with a wife and two children three thousand dollars a year. It is not necessary that such student support be only grants and loans. The work part of the work-study program could enable students in problem-oriented programs to earn much of their own way.

FINDINGS AND RECOMMENDATIONS

We conclude from the above that the problems are serious, that faculty and students are available for some new and imaginative efforts, and that present federal funding policy works in opposition to funding the kinds of efforts that seem to be successful.

We recommend that the Federal Government support formation of Schools of the Human Environment at colleges and universities. These programs should be expected to vary in their emphasis from university to university and from region to region. Their common purpose, however, should be problem-focused education and research directed toward people—their need and desire for a satisfying life in pleasant surroundings. Such schools or programs can begin the task of providing trained professionals to work on environmental problems, help to define what is possible and how to get it, and provide opportunities for the justifiable desire of many young people to devote their attention to environmental problems.

The Federal Government cannot start these efforts alone. Colleges and universities should exhibit their commitment to environmental programs with people and funds. *In particular we recommend that such programs meet the following criteria*:

(a) Substantial or complete control of the faculty reward *structure* and

(b) *a relatively free hand to be innovative in introducing course material, educational programs, work-study programs and curriculum requirements for degrees.*

(c) The focus of environmental programs should be expected to vary from institution to institution and the funding agencies should ascertain only that there is problem focus to the activity (whether technological forecasting, pollution abatement, urban planning, long range society planning, or a number of other continuing problems.)

We recommend that funding programs include at least the following items (but not necessarily be limited to them):

(a) *Continuing core funding for the program as a whole.* These funds should enable research and educational activities to go on at a modest level to be supplemented by project funding both from the government and from private sources.

(b) *Seed money for faculty salaries* is important since in the initial phases of the program private or state monies are not ordinarily available. As students become engaged in such programs these funds can be expected to be replaced by those from other sources. Institutions should indicate their willingness to seek such sources.

(c) *Seed money for educational innovation.* As we have tried to make clear above, new methods and techniques will be necessary to do problem focused education in somewhat different ways than that done in the traditional academic disciplines. It is important that educational materials, release time for faculty, and other expenses be funded so that these innovative efforts can go forward as rapidly as possible. Funds for such innovation may already be available under programs authorized for the Office of Education, HEW.

2. *We recommend that work-study programs for both faculty and students be a prominent part of environmental programs.* In the effective programs currently underway it was obvious that the real life experiences of both faculty and students played an important part in their contributions to the programs and to the educational experiences of themselves and others. Since we are concerned with real-life problems it seems obvious, and was borne out by our study, that work-study programs are extremely useful. They are useful to the students as part of their education, to the faculty, in renewing their contacts with the actual problems, and should be of considerable use to the government by bringing in vigorous faculty and students for short periods and returning their own officials to the university both as students and as teachers.

3. *Student educational support is essential as a part of environmental programs.* While some training grants have been available under previously existing programs they are generally limited in scope and force students into different career patterns because of the lack of continuing programs that they can identify with. Student support need not be in the form of grants or scholarships. Loan programs would be appropriate as would jobs at attractive rates of pay during the work part of work-study programs recommended above. We have concluded that reeducation of professionals from other disciplines or simply self-renewal of those practicing professionals related to the environment are a persistent need (see, for example, description of a man of fifty returning to one of the universities). For those undergoing reeducation or returning in mid-career higher support levels would be necessary since they customarily have families demanding more support than a single, young student.

4. *Recommending funding levels.* We have felt that the interest and the able professionals are available to expand the presently effective efforts by ten to a hundred times. We conclude that somewhere between ten and twenty major universities have programs sufficiently far enough along to be ready for funding. The cost of such a program depending on size and extent would range from two hundred thousand to about eight hundred thousand dollars per year including all the features mentioned above. In addition, we recommend planning grant support for some of the two hundred or more universities who have expressed vigorous interest in this area that are not sufficiently far along to offer a definite and fundable program. Such planning grant support probably should be $50,000 or more for a one or two year period. Thus we recommend that approximately twenty million dollars be devoted to this program at the outset. Because certain aspects of the program should diminish in cost after the initial grants it is not likely that these funds need grow at a substantial rate in the first few years. It is our firm opinion that the government would get more return for its money in programs of this sort than they now get from some of the existing training grants and contract research. (See Dr. Cunningham's comments on this point in Appendix 1.) Therefore the recommended twenty million dollars does not need to

be entirely new money. A crude estimate is that about one half would be new money and about one half could be diverted from existing funds expanded under titles related to the environment.

Funding procedures should involve those agencies with a mission for problems of the environment. They should certainly include the Departments of Interior; Transportation; Housing and Urban Development; Health, Education, and Welfare; Commerce; and Agriculture. The National Science Foundation should fund programs that are not specifically a part of any agency responsibility but show promise for the future. The agencies mentioned have been notoriously ineffective (with a few exceptions) in funding institutional arrangements at universities. We therefore recommend funds be assigned by these agencies to this program and that some senior people from these agencies be brought together under the policy guidance of the President's Environmental Quality Council with representatives of NSF, NASA, or DOD to take a lead role in the initial funding in a common effort embracing all the agencies. Eventually all the agency members should return to their own agencies to constitute a Bureau of Institutional Funding operating directly under the Secretary of the Department. Such a funding arrangement appears to answer most of the past difficulties pointed out in Appendix 1.

Appendix 1.—Federal Administration and Support of University Interdisciplinary Research

(By D. E. Cunningham)

INTRODUCTION

It is evident that the vital problems being recognized now, and which must be solved in the future, possess a degree of hitherto-unknown complexity. To successfully solve these problems new approaches must be developed, approaches requiring use of coordinated and integrated disciplinary knowledge. As is always the case, trained manpower is needed to undertake the research necessary to achieve solutions to these pressing problems. The university as the producer of trained manpower and conductor of research must be involved and must respond to the challenge presented by the new problems—in fact, to produce adequately trained manpower the university must be deeply and actively involved in research, both basic and applied, in the vital areas of concern.

These complex problems are national in scope and so the federal and local governments have an abiding interest in their solutions. To a large extent this interest will be expressed through financial interactions between government and universities and it must be recognized that it *does* matter in what form the financial interactions take place. It can, indeed, make the difference between progress in spite of the system, or progress because of the system. It is clear, too, that a single funding technique will not be appropriate for all approaches to the broad spectrum of problems—for as always, some problems are broader than others, and in some adherence to rigid time scale is required, others do not have the same requirements of immediacy. Implied here is that the funding technique used may need to change as research and development efforts reach different stages in the problem solution cycle. Administratively, this fact presents difficulties.

Various agencies of government have attempted to support multidisciplinary investigations during the past ten years. The effects of these efforts have been mixed. In particular, attempts to involve the disciplines of the social sciences with the science-oriented disciplines have been abject failures. The necessity for developing meaningful enterprises remains, though. Perhaps the reasons for failure are connected with the response time—that time which an institution takes to "react," or change—rather than with the approach. Perhaps it is a fact that the truly interdisciplinary unit in a university is alien, at this time, to the discipline-oriented structure of the university. Perhaps the problems to be faced have not been defined precisely enough to allow an intelligent approach. Or, perhaps the problems so far encountered to not require the mobilization of resources across the board in order to achieve "satisfactory" solutions. There are other possibilities, almost as many as there are problems, universities, and pin points of federal interest and to be complete in their enunciation would be impossible.

What will be discussed in this paper are some of the administrative formats which have been used, why they have been attempted, what the pitfalls are, and to a limited extent an appraisal of the sort of problem which each might be expected to deal with most appropriately.

One further point should be made. This is that what is said here is said from the federal and/or state government point of view. It *does not* discuss the administrative match which should ideally occur at the university. It does not take into account the fact that the reward syystem for the individual faculty member at a university is almost totally ungeared to interdisciplinary activities. And it does not take into account the effect of many years of federal dealings and support aimed at that individual faculty member rather than the university as a whole. This latter point cannot be emphasized too much since, if the government desires total university response, this response represents a total change in expectation to that which was cultivated in the past. It will take time to break this barrier, and breaking it will not be an easy task. (These points are dealt with in some detail in the main body of the report.)

ADMINISTRATIVE FORMATS

There are at least seven distinct administrative techniques which have been used in the past years to fund and stimulate interdisciplinary research on the campus. All have features appropriate to particular problem solution. All also have drawbacks. Several of these techniques will be discussed in detail.

To establish a framework for discussion, the approaches so far used might be broken into the seven categories listed below:

1. Mission Oriented Block Grants
2. Institutional Grants (based on some formula)
3. Request for Proposal (RfP) Solicitation
4. Agency on-site Extensions
5. National Laboratory Involvement
6. Establishment of non-profits
7. Use of personnel through consultants, WAE (when actually employed), personal contracts, etc.

Each of the above has been developed in response to certain needs. How appropriate each, or all, is to studies of the broad problems of today is not well understood. Let us look at what the details of each type are.

MISSION ORIENTED BLOCK GRANTS

In this technique a university is asked to devise a theme which is in consonance with its mission oriented agency sponsor aims. The theme is surrounded by the contributions of individual faculty and the integration of the theme is performed at the university—generally by a committee. Funds go from the agency to the university where they are disbursed by action of the committee. In principle this sort of granting technique insures the cooperation of the university and the agency in pursuit of appropriate mission oriented research and training. Problems arise at both the university and agency sides, however. At the university the lack of a real management structure becomes evident. Fragmentation of funds, lack of educational involvement, communication difficulties both with the agency in question and within the faculty itself are some of the factors which result from this lack. On the agency side, problems of matching agency mission to the output of the university is particularly difficult. The results supplied, if they are worthwhile, point the way toward the future. The value to the operational side of an agency is minimal since its concern must be frozen to some time in the past. It is not evident to the operating personnel of the agency how the block grant funds contribute to their future success, and they are sure they can spend the funds more wisely—and certainly they can from their point of view. The "middle men"—the administrators of these block grants at the agency—find themselves in a difficult situation and in a time of static or declining budget have little concrete to point to as the result of their programs.

Many agencies (NASA in the Sustaining University Program, DOD in Themis, etc.) have attempted this approach and the results have proven less than outstanding. Perhaps the universities were not ready for this type of funding, but perhaps they are now. Perhaps the real problems to be faced must be more delineated and the time to expected response be lengthened to correspond more with the typical delay times encountered in universities. What is evident, though, is that this technique has helped to produce some university groups capable of undertaking and performing interciplinary research—not enough, by any means, but some that do provide a possible base for expansion.

Factors of the dollar size of these grants in relation to their hoped for effect must also be considered. For example, if the cost of producing a single student with a PhD is of the order of $75,000, then the impact of a $100,000 grant or contract will not be large in an immediate sense. Further, how much agency effort can be expended in monitoring a $100,000 grant—certainly not an excessive amount and so coupling between agency and university suffers. There are many more considerations of this type, but the above are two of the most significant.

INSTITUTIONAL GRANTS BASED ON FORMULA

Here recognition is given to the fact that an institution performing research in some broad area, e.g. health research, incurs costs not covered by the sum total of individual grants and contracts it receives and further that, to be most effective, some "risk" capital to seed new research must be available. In order to supply funds of this type an agency may take as a base for an institutional grant some percentage of the total dollar amount of active grants and contracts, perhaps matching an initial amount of funds and then a decreasing percentage of dollar amount over that, and award funds in this fashion. The tacit understanding is that these funds will be used to develop further capability in broadly specified areas. In this way the capability of an institution to function in these vital areas may be enhanced.

Unfortunately these grants suffer from three deficiencies. First, no indication of what the funds might be used for is required—no theme is established except in a very general way. Second, because there is quite clearly a crisis in the funding of higher education, such institutional grants tend to be spread out through the general funds of the university. This spreading might be defended as a way to benefit the educational institution and research on a broad basis, but it is definitely not as a stimulus for *interdisciplinary* research. Third, where there is a spending ceiling, as imposed by the National Science Foundation during the last two years, these institutional funds are the first *not* to be spent, since the internal pressure supplied by NSF-sponsored project investigators is intense in comparison with the desire to spend money for which there is, at best, a vague general plan for commitment.

REQUEST FOR PROPOSAL SOLICITATION (RFP)

The rfp is one of the classic forms of contractor solicitation. While usually not used in the performance of work of a more basic research type, there have been cases where it has been. Usually a broad task is defined in a particular area and the solicitation takes place. As a result of proposals, awards are made.[1] At this point a decision must be made on where the integration of results is to take place. It may be that a strong agency technical staff feels capable of performing the integration, or it may be that the integration is left to the university. In either case certain problems can arise. The basic one is the "freezing" of subject area around the original rfp, the choice of which tasks may have been made by various routes. The choice can become obsolete very rapidly, but the response of the agency may be very slow. Universities, too, have not been overly responsive to the traditional rfp for various reasons. The agency writer for the rfp may not express his desires in terms the university investigator can understand. Further time limits are very difficult for universities to meet. The proposal lead time is frequently too short for the typical university to meet and the detailed checkpoints placed on various segments of the rfp do not recognize the nature of the university operation such as use of graduate students to assist in the research, etc., which make attainment of deadlines difficult indeed. These factors are recognized in the unsolicited proposal technique, but the interdisciplinary programs so developed appear to be more "after the fact" than real.

Finally, the integration of results requires a strong agency staff, a condition which can lead to active competition for agency funds between the agency staff and the solicited (or unsolicited) contributors. On the other hand integration at the university implies a very deep understanding of agency intent—a condition difficult to attain when the rfp is written in semi-isolation from the university asked to perform the task.

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[1] I include here, too, in spite of my category unsolicited proposals submitted as a result of avowed agency interest in a given subject area. For example, research in areas pertinent to the understanding of cancer takes place through unsolicited proposals, but only those proposals having some relevance to the cancer problem are funded.

AGENCY ON-SITE EXTENSIONS

Various agencies have, from time to time, set up what amounts to an extension on or near a university campus. The size of the extension may range from one professional staff member to a complete laboratory staffed by civil service personnel. The aim of the extension's activity is fairly well defined, and well integrated with the mission of the agency. The desired result is to mingle with the university staff and its graduate students with agency staff in order that these university resources might be put to use in the pursuit of the mission. The university personnel are used on a hired basis for varying periods of time—a summer, a year, part time, etc. The results achieved are collected and packaged by the agency extension staff.

Considerable flexibility is available under this plan. For example, the employment procedure might involve a direct payment to the individual, payment to the university for part of a faculty member's time, or the usual grant or contract administered at the local level. In short, the techniques that have been used have depended primarily on the ingenuity of the local management in the performance of the task.

There are difficulties in this arrangement too. What, in effect, is done is the supplying of a management structure aimed at carrying out interdisciplinary research, a management structure which it is supposed the university lacks. What might happen is the conflict of two structures, neither one of which has been fully developed on the college campus. Strangely, there seems to be considerable support for the establishment of such organizations on college campuses, and a feeling in the agencies that the existence of this sort of structure might interfere with the academic organizations.

The tendency of organizations to grow without good reason for growth has been note das a drawback to the implementation of the concept, and once again the problem of creative monitoring comes to the fore. The agency management must distinguish between growth for growth's sake, or growth necessitated by greater understanding of the problems and possible solutions. The funding of such units also, most likely, involves interagency cooperation toward an overlapping goal, a difficult thing to achieve at best and particularly difficult in times of static budget.

What the academics see good about this scheme can be briefly stated as the lessening of pressures to change universities in short periods of time while at the same time allowing a university response to the vital problems of the day. The approaches that are effective might be absorbed into the university structure itself, after the period of test.

NATIONAL LABORATORY INVOLVEMENT

The various national laboratories are certainly a potential resource in the general development of means to cope with the new problems. They contain talent, equipment, and resources which could be of great importance in contributions to efforts of the next ten years. There are, however, many problems inherent in the structure of national laboratories which make their use very difficult.

First, national laboratories are usually funded primarily by a single agency and hence their mission is closely allied with that agency's mission. This is as it should be, but to now concentrate on broader problems which overlap individual agency responsibility requires means of coordination which do not exist at present. We can talk as much as we want, but unless (at the working level) it is realized that there is joint responsibility for carrying out broad programs, those programs will not be carried out.

Secondly, national laboratories have usually been set up because the equipment and resources they possess are unique—generally too expensive in acquisition cost, and too expensive in updating and upkeep for a single university to finance. They then offer special facilities which may be used on demand by visitors. The visitors may receive support in a variety of ways as before—direct, thru his university, or by a grant or contract. In order to keep abreast of what is going on, a staff or high quality must be in residence, a staff which has interests in these areas in which possession of the highly specialized equipment is vital. In the face of this history, it is not at all evident that the analysis of the problems we will face in the next decade will require sophisticated equipment of this type, nor for that matter the deep specialization that characterized fundamental research in the national sciences. In short, the historic mission has dictated the personnel requirements, the requirements have resulted in acquisition of the personnel, and the personnel do not have interests and skills readily transferrable to investigations of the type we need.

Note, though, that this same argument can be applied to the universities of today and does not imply at all that the national laboratories should not be of enormous use in the future. What it does imply is that methods akin to those necessary to channel the university must be created, which will allow the resources to come to bear. In the same sense as a university is an institution, so is a national laboratory and what is needed are means and the desire to change institutions.

Some laboratories have made progress toward developing a capability to study and interest in studying the broad problems referred to above. AEC laboratories have been allowed to conduct non-AEC related research and development since 1961. At present the Oak Ridge National Laboratory does 14% of its research under sponsorship of agencies other than the AEC. This laboratory is, however, an exception even within the AEC structure since Argonne and Brookhaven, for example; have less than 1% of their efforts funded by other than the AEC.

ESTABLISHMENT OF NON-PROFITS

A non-profit, located near a university or universities can function in the same manner as the federal laboratory extension. The difference is that a direct line of authority to the agency in question no longer exists. The mission is defined, the university resources are utilized, faculty staff and students participate in the program of the non-profit. It is more isolated from the central agency than the on-site agency extension, of course. The insulation offered by the non-profit establishment can have both good and bad values. When the insulation leads to an ability to view problems in broader perspective and over longer time periods, then this feature is a good one. When the insulation adds barriers to direct communication with the agency and with the universities then the non-profit does not serve its purpose.

Another drawback which may become evident as time passes is that the non-profit may actually compound the management problem. It can occur that an organization set up to supply management of university resources toward an established goal may actually come in conflict with the academic process through lack of understanding of the academic environment, or through its recognized and avowed aim of bypassing. What occurs in that case is certainly not conducive to the performance of any mission.

Aside from the obvious problem many the same comments might be made about the non-profit as have hitherto been made about the on-site agency extension. The non-profit can potentially allow greater freedom to perform the mission, due to its separation, but in its separation it may become less responsive to agency mission. This need not be a deficiency in the technique, since frequently long terms and short term missions differ and an agent acting in the long term sense may actually be more responsive to the real needs of an agency than one which is actuated by day to day demands. To phrase it another way—it is the problem's solution which is important not the agency's interpretation of the problem.

USE OF PERSONNEL

This is perhaps the oldest form of administrative technique used to perform specific tasks. Consultants, use of WAE (when actually employed) personnel, small contracts for individual services have been utilized to achieve the specific goals which have been previously defined by an agency. In general this technique is best used where there is an internal agency competence which is capable of selecting the goal and integrating the results purchased from the individuals involved into the overall program. It does not work in cases where the goal is relatively undefined or where there is no good structure or ability at the agency level to assimilate the results. Further, this technique does not bring large scale interchange of information at a level deep enough to cause and allow constant reassessment of goals—a necessity if the large scale, less well defined and more complex problems of the future are to be solved. The mechanism is useful, but most likely will achieve its maximum effects in conjunction with the various other techniques previously discussed.

GENERAL COMMENTS

The foregoing has been a brief discussion of the various modes so far used by government to stimulate and support interdisciplinary research. Each technique blends into the other at some point, and each has its best region of applicability. A few words should be said about general problems inherent in the undertaking of interdisciplinary research independent of what particular administrative funding technique is used.

It has been recognized that the problems to be encountered in the next decade are problems which will involve the participation of many disciplines. This fact connotes team approaches, or at least team coordination in the approach, or analysis if there is to be any hope of success. Just as the disciplines must overlap, it must be recognized that there will most probably be agency overlap since agencies themselves have arisen and grown along discipline-oriented lines. This means a coordination of federal agency approach will be necessary. Coordination of approach is difficult in good budgetary times and grows increasingly more difficult in times of decreasing budget.

It appears that groups like FICE or CASE cannot accomplish this coordination since they are groups essentially without mission-oriented direction and without the ultimate power to require coordination on big things rather than small. Only agency administration or those in top echelons can give agency positions, or conversely even bring the serious policy questions to the attention of their own agency for consideration. Some representatives at these levels attend and follow through on meetings of these groups, but in general the representation is distributed over various management levels including, of course, management levels that have day-to-day responsibilities which preclude active follow through.

Further, it is recognized that where goals are set, we can accomplish those goals by careful planning, we cannot plan and coordinate an interdisciplinary effort unless a goal is set. Great haziness exists on what should be the priority of goals, and we find ourselves in a position where we have very little of the data necessary even to make informed opinions on this question. Goal setting need not always be global but goal setting in at least some limited sense must be attempted. As long as the scope of goal setting is kept reasonably small, and the experiments in implementation reasonably small, we will at least generate the data on which to make decisions.

Further, what we are facing is a situation where we have resources in depth, but not in breadth. This characterizes the situation at the university, in the national laboratory, and in the government. What is needed is the mechanism to bring these in depth resources to bear, to finance the effort, and to make use of the results. This requires a close coupling of management with problem analysis, and since it is apparent that this coupling has not been successful in the past, we should experiment, but with some idea of what we are experimenting to achieve.

Other items should be noted in passing. The cost of producing a Ph. D. is not universally agreed on, but it is in the range of $75,000 per (see Mission Granted Block Grants). With this fact in mind it is evident that grants of the order of $100 K to $300 K or so can only serve a "tickler" function—they can only be superimposed on something already existing. While the focus of what is being done might be somewhat changed, deep changes will not take place in the short run. If, however, the grant is maintained over a long period of time, say five to ten years, the focusing effect will probably cause changes because of the fact of hiring policies' being influenced by the focus. Thus, changes cannot be expected in short time unless the federal commitment is large. Largeness, though, is not an easy way of assuring desired effects. Very few universities can accept a large grant or contract on a "new" area and absorb the activity undertaken into the academic structure—rather than adjacent to it. If it is adjacent, it most likely will not involve faculty and students, but rather will develop resembling more a neighboring non-profit than an integral part of the university. Careful planning to assure involvement with the university is necessary—if possible development of an academic base for the activity. It could be that this will require a new "function oriented" academic department. Departments are not created overnight and so the pressure of funds, if present in sizable qualities, may actually be counter productive over the long run to the avowed purpose of getting the university as a whole and as a unit involved in the solution of and training for the problems of the future.

The problem of meaningful evaluation of the effects and outputs of interdisciplinary grants has been mentioned. Not only does this involve the question of who is to do the evaluation, but it is also one of how a program rather than a project is evaluated. One manifestation of this is the relative value of having a good participant in a project located across the hall versus an excellent contributor two thousand miles away. A strict *project* review would point toward using the excellent contributor while a *program* review might indicate the opposite. In either case, the hitherto firm basis on which proposals are judged—that of excellence has, at least been challenged.

Many other factors could and should be considered before coming to firm decisions as to whether there is a best way to stimulate, administer and support interdisciplinary research. For example, is the purpose of the grant to "seed" new areas, or is it to expand capability in an existing area. If it is a "seed" grant, how is the transition made to any other form, assuming the seeding is succesfsul. Should there be time limits (3 years, 5 years or some other time placed on such grants? If so, what mechanisms will be provided by the government and by the universities to assure continued support for good projects after the time limit has expired? If a university group succeeds in developing an interdisciplinary capability and outlook, it also will outgrow the sponsorship of a given agency. Thus, to continue its work it will require coordinated multiagency support, a goal difficult of attainment.

What is clear is that many approaches have been attempted. Little quantitative data exists as to the success of the various attempts. Little experimentation has been attempted to determine the range of applicability of each approach in terms of agency character and competence, agency resources available for interdisciplinary research, and agency definition of problems. We need to develop this data if we wish to plan administrative and funding techniques appropriate to the problem. Such data will only be derived through experimentation by the agencies and evaluation of results achieved by various approaches to segments of the same or similar programs. In short, what is vitally needed is a quantitative study of the effects of agency administrative structure on the stimulation and output of interdisciplinary research.

Mr. BRADEMAS. I have a number of questions to put to you. One has to do with the present status of the recommendations in your report. I believe you said that you were urging the expenditure in the initial year of a program in the amount of $20 million, some of which could be transferred from existing programs for helping establish at existing colleges and universities in the United States of schools of the human environment.

Can you tell us what kind of reaction you have had from the President's Environmental Quality Council, or its successor?

Dr. STEINHART. There has been little formal reaction to those suggestions, except a modest amount of encouragement. To my knowledge no specific funds have been appropriated for these purposes. But this should be tempered by informal information that the National Science Foundation is being encouraged to divert some of its funds into broader purposes in which the environment would be a high-priority item.

I have no knowledge of how this has been implemented.

Mr. BRADEMAS. I take it the fundamental thrust of your report was, indeed, in effect to restructure at colleges and universities some of the efforts in the whole field of what might be called "environmental education," in order to establish a multidisciplinary approach.

Would it not be possible, with existing programs, to embark upon such a reshaping? That is to say, it would not be necessary, would it, for the Federal Government to provide additional funds for multidisciplinary approaches to environmental education to be undertaken?

Dr. **Steinhart.** It would be possible if the rules of the current grant lines were changed. So long as they are funneled into the narrow disciplinary departments, I submit you will get nothing but more of the same, and you will get little in terms of multidisciplinary education.

Mr. **Brademas.** That is a scathing indictment of the university faculties and administrations of this country.

Dr. **Steinhart.** We have a strike at the University of Wisconsin at the moment. The teaching assistants have gone out for better working conditions and a voice in educational planning. Without passing judgment on those issues one way or the other, I was astonished in the faculty meeting to listen to one of the senior faculty state before his colleagues, "You have to be careful. If we negotiate a contract with them this time, they are going to want to negotiate when that one expires."

It was quite clear that a large number of the faculty were opposed to the idea of labor unions. I don't think this impugns the faculties' expertise, but their understanding of modern society is somewhat limited.

Mr. **Brademas.** As one who is a critic of the seniority system in the House of Representatives, though a modest beneficiary of it, I would say I would not be surprised to learn that a number of the most severe critics of the congressional seniority system in the university community are probably professors who cling most tenaciously to their own seniority arrangements or the nearest analog thereof.

Do you quarrel with that?

Dr. **Steinhart.** Certain parallels have occurred to me from time to time.

Mr. **Brademas.** What I am talking about now, as I am sure you are aware, does not directly deal with the nature of the bill before us. But, if I understand you correctly, Dr. Steinhart, you are saying that unless, with respect to Federal funds, the rules of the game are changed, there will be no significant move in the direction of multidisciplinary approaches in American higher education.

Dr. **Steinhart.** I think that is correct. I think the important point to emphasize is to try, difficult though it may be in these days, for all of us to put ourselves in the position of the student. It is all very well to have monitoring programs and research programs which may, added together, be somehow vaguely interdisciplinary. From the point of view of the students confronted with a choice of getting a degree in biochemistry or plant physiology—and there is nothing in between—there is nothing to identify with that has the breadth of vision that they feel they need.

If I find a school that offers real breadth of vision, I am going to gather up some of my students from the East Village and the Berkeley slums and bring them back to try all over again.

Mr. **Brademas.** There are implications to what you just said. One suggestion is that if we are going to make serious headway in the direction of the recommendations in your report, we are going to have to reshape the authorization legislation in the field of higher education to a considerable degree. Another is that it is not a particularly hopeful harbinger for the kind of leadership that we might expect out of higher education in the United States in the ecological field for elementary and secondary education, and education at the community level.

That is to say, where are the elementary and secondary schools to encourage environmental education, which is the principal purpose of the bill before us, going to turn for intelligent teacher training, or intelligent curriculum development, or intelligent project demonstrations, if all of the university people are living in their narrow little cubicles?

Dr. STEINHART. Certainly Commissioner Allen of the Office of Education has expressed a number of the same frustrations that I think I have been expressing in the last few minutes. One hopes that some of these programs may be urged forth, especially with the help of Congress.

In terms of the universities, I don't mean to paint the picture entirely black. In terms of individual people, I would say a very large number of individual teachers at the universities are prepared to do all kinds of things. A very distinguished physician walked out of his cancer research lab and joined one of the problem-oriented programs. Such things are not uncommon.

It is the institutional purposes of the expert technocratic educational idea that we have fostered for a great many years which are at odds with the kinds of approaches I think you are seeking in this bill and which I would certainly like to see.

Mr. BRADEMAS. It may well be, then, that we should change the language which I believe the bill now contains, which in effect suggests that most of the curriculum development would be done by colleges and universities, to be sure that that language is flexible enough that we are not hung up on higher education in this country, depending solely on them to be helpful to us in producing the kind of program we need at the elementary and secondary level and for community conferences.

Dr. STEINHART. Provided there is flexibility, I think in my statement I was trying to make clear there are a sufficient number of people prepared to do the right thing and prepared to do, I think, some experimentation, since we don't know all of the answers on how to do these things, provided the legislation and the implementation is flexible enough to permit it.

In our new Institute for Environmental Studies at the University of Wisconsin we will have this summer a group of 10 students and a young faculty member designing the new curriculum for this program. That seems to me to be the kind of approach that one would like to take.

Mr. BRADEMAS. Are there many universities in the country where there have been established relationships between those concerned at the university, that is to say, the scholars at the university, with the local school system with the environmental studies field?

Dr. STEINHART. Of the ones we looked at last year, I would say there are half a dozen or so with well developed relationships of this kind, and perhaps another 20 or 30 that are moving in this direction in ways that I certainly would think were quite hopeful, although it was a little new to report any great successes.

Of course, one of the greatest difficulties on the university campus on this score is the School of Education. And if you take the somewhat cynical and kind of cute comments I made about the rest of the university faculties and multiply them by a large number, you have the School of Education.

Mr. Brademas. Can I ask you why you said you were uncomfortable with the term "environmental education"? We did not use the term "conservation education," but thought "environmental education" would be broader.

Do you have a better phrase?

Dr. Steinhart. I suppose it is because I always root for small guys and losing teams. Therefore, the current fashion always makes me somewhat uneasy. I think it is all right. I think the point being made by Dr. Mead several times in this morning's discussion is that somehow there ought to be an inverse-square law relating to people. We not only suffer from most of the troubles, but we made most of them.

If this bill is for a program in scientific ecology, I would find myself in considerable disagreement with Dr. Libby, who seems to be directing environment to some other kind of technocratic expert to tell those people what they should do. This is a human problem.

Mr. Brademas. What you are talking about is having an accurate definition of the phrase "environmental." That is to say, we need to be sure that the phrase "environmental," or that word, embraces the adjective "human."

Dr. Steinhart. I think that is very close to it. What we found disturbing last year, and have been having difficulties with in the program I am trying to join with, is how to bring humanists themselves in the educational system into this collection of questions about the human environment. They seem somewhat uneasy, and no one is sure how to do it.

Mr. Brademas. We invited a theologian and an artist as the lead witnesses on this legislation, because we were anxious to establish at the outset the kind of concern that I think is representative of what you have said, and also, I take it, the reason that you in your report recommended the establishment not of schools of the environment but schools of the human environment.

Dr. Steinhart. That is exactly right. Your committee exhibits more of the understanding of the problems in this case than many of the senior faculties of the university, who look for a collection of specialists to add together.

Mr. Brademas. We are politicians.

Dr. Steinhart. I am beginning to think that is a better preparation for understanding people than academic preparation in many ways.

Mr. Brademas. I have one more question. What do you have to say with respect to the attitudes, values, life styles, if you will?

Dr. Steinhart. It happens this semester I am living in the midst of the student radicals, revolutionaries, or what have you, at the University of Wisconsin. It is an interesting experience. What I think we must begin doing at some time in the near future is to begin to encourage people to experiment with how they live and inquire seriously how these experiments come out. I am talking about communities, towns, cooperative arrangements of various sorts.

Much of the experimentation is going on among the young, and it is undeniably aimless, frequently destructive, and certainly is not a long-term solution. Yet, at the moment, it is quite unpopular to express the idea that you might permit people to experiment with how they live, or in fact encourage them to experiment with how they live.

We, instead, tend to experiment on people. After all, any new Government policy is an experiment on people. We don't call it that, but that is what it is. It seems time to permit some experiments with people than can be turned off after you find out how they work, particularly if they don't work well. I hope there are members of the population over 25 who will become involved in some of these experiments. Some of them are going to be around a long time yet.

Failing that kind of experimentation and discussion of it and analysis of it I really don't see how we can expect anything other than the same kind of aimless, frequently destructive dropout kind of experimentation we see going on at the present.

Mr. **Brademas**. This has been very helpful, Dr. Steinhart. I think you have alerted our attention to one of the very serious problems in making an advance in this field, namely, the narrow rigidification that prevails in university faculties. And though this bill is not fundamentally a higher education bill. I think the problem you discussed is one we must have in the forefront of our own thinking if we are going to be able to encourage effective environmental education at the elementary- and secondary-school level.

Dr. **Steinhart**. I think the universities have, and in certain specialized circumstances, can provide feedback into the secondary schools, and the community at the adult-education level. It is the focus on professional education, as little teaching as possible, as much—as many papers as possible that place serious opposition to much more free-flowing higher education programs in which the feedback to the high schools and to the community is not only encouraged but is just the accepted way of doing things.

There are benefits on both sides. Students are increasingly anxious to work in the communities, and with good reason. Members of the community find in this kind of interaction relief for their frustration of not knowing what to do about things that disturb them.

In the case of high school students, some of the letters we get are simply tragic in their dismal view of whether or not there are even going to be a few more years of future to work with. I don't think things are that bad, and let's hope we don't let them get that bad.

Mr. **Brademas**. Thank you.

Mr. Hansen?

Mr. **Hansen**. Thank you, Mr. Chairman.

Thank you, Dr. Steinhart, for a very helpful statement.

To pursue the point you were just talking about, I sense that in this growing interest, particularly among the young people, in the environment there is a tendency to classify people and some institutions as polluters and others as nonpolluters.

Also, it would seem to me that in an educational process a good beginning point is an acknowledgement that there are no nonpolluters among us, and that we all contribute to the problem and have an obligation to help find the solutions.

Would you concur with that?

Dr. **Steinhart**. Oh, absolutely. One of the reasons I find it difficult to endorse only the need for technical specialists as a solution to the problem is that the solution to the pollution problem is clear. You have only two options. You either spread it around thinly, or you eat it. That is all there is. The rest is engineering.

In a somewhat larger sense, it is the devotion to unbridled growth. When unbridled growth occurs in the human body, doctors call it "cancer." Unless one begins to try to curb this, I don't see much of anything that can seriously be done.

I think that focus, which frequently does occur, as you suggest, that there is somewhere a guy in a black hat saying, "Let's give them another dose of smoke today," is not very useful.

Mr. **Hansen**. I appreciate your concept, also, that it is really far more basic, and what we are looking at ultimately is a change in the system of values.

Maybe instead of using a dollar sign as the measure of so many values in our society, the purity of the air or the water or the scenic beauty of the countryside will be placed higher on the scale of values.

Dr. **Steinhart**. It seems to me that human dignity and satisfactions encountered in their lives are the scale of values we would like to have. I am not sure it would be something that would be measurable, or that we should measure it if we could. But I do think that somehow we have to change present values.

The national budget reflects our national priorities. And I assume it represents something about our values in the Nation. I find that disturbing.

Mr. **Hansen**. One final question. At least one of those who wrote to me on the bill in response to an inquiry I made soliciting comments of one of our earlier witnesses, took exception to our use of the term "ecological balance." And I suppose the implication was that it was a static system.

Does the use of that term in the bill as we have used it disturb you?

Dr. **Steinhart**. Absolutely not. I think the word "static" is pejorative. But if you talk about it as a "steady state system," I don't see how anyone could object to that.

The alternative seems to be "unstable."

Mr. **Hansen**. Thank you, Dr. Steinhart.

Mr. **Brademas**. Dr. Steinhart, your testimony has been most helpful. I know in discussing environmental education in talks, and so on, here and there I draw heavily on the report that you and your associate, who I understand is now an undergraduate at the University of California at Berkeley, Stacy Cherniak, put together, because it seems to me to represent the most thoughtful survey I have seen on the role of colleges and universities in the whole field of higher education. I hope that we will take to heart what you have been admonishing us to do.

Thank you very much indeed.

We are adjourned for this morning.

(Whereupon, at 11:40 a.m. the subcommittee recessed, to reconvene at 9:30 a.m. on Thursday, April 9, 1970.)

ENVIRONMENTAL QUALITY EDUCATION ACT

THURSDAY, APRIL 9, 1970

House of Representatives,
Select Subcommittee on Education
of the Committee on Education and Labor,
Washington, D.C.

The subcommittee met at 9:45 a.m., pursuant to recess, in room 2175, Rayburn House Office Building, Hon. John Brademas (chairman of the subcommittee) presiding.

Present: Representatives Brademas, Steiger, and Landgrebe.

Staff members present: Jack G. Duncan, counsel; Toni Immerman, clerk; Arlene Horowitz, staff assistant; Ronald L. Katz, assistant staff director; Maureen Orth, consultant; Marty L. LaVor, minority legislative coordinator.

Mr. Brademas. The subcommittee will come to order for further consideration of H.R. 14753, the Environmental Quality Education Act and related bills.

The Chair would like to announce that tomorrow we shall continue consideration of this bill with the witnesses scheduled, Congressman Nick Galifianakis of North Carolina, Miss Martha Henderson of the Conservation Foundation, and a representative of the American Forest Products Industries. Then the subcommittee will go to New York City for hearings on Saturday morning of this week.

Our first witness today is Dr. John Cantlon, ecologist and the provost of Michigan State University.

We are pleased to have you with us this morning. Please go right ahead.

STATEMENT OF DR. JOHN CANTLON, ECOLOGIST, PROVOST OF MICHIGAN STATE UNIVERSITY

Dr. Cantlon. Thank you, Mr. Chairman, and members of the committee. I would like very much to speak in favor of House bill 14753. In my view, we now need a major effort in improving the educational resources, the techniques and so on in both public schools and in the mass media for enhancing the understanding of our present and future citizens concerning the ecosystems that sustain them.

Long ago, in this country, we made the very logical decision to have publicly supported schools to impart to the future citizens of the country the minimal skills in reading, writing and arithmetic. Almost as early, we insisted that these students be exposed to a certain minimal level of mastery of the concepts and the knowledge about certain subject-matter areas.

For example, we insisted that each student be exposed to the essentials of how his Government works. These courses are called American government, or civics, or political science, and they are required subject matter in each of the 50 States.

In addition, each State requires that American history be taught in order that each student can appreciate the sacrifices that are required to sustain the social machine that is our Government, and although recently our black citizens have pointed to some of the inadequacies and omissions in American history as it is taught in our public schools, no one has seriously proposed that American history be deleted from the public school system.

Citizens obviously do need to know how their Government works, how it got that way, and what sacrifices are necessary to sustain it.

Another major requirement that is widespread in public school curriculums is how an individual's own body works, the basic physiology, the basic structure, the nature of the human body. This learning operation is couched in different kinds of packages. It may be in the general sciences course that all students take in junior high, or in the high school biology course, or in a hygiene course, or in the physical education part of the curriculum. Wherever located in the curriculum, throughout the country we require this minimal knowledge for an adequately educated citizen and human being.

Other knowledge required is a rudimentary understanding of international affairs, a rudimentary understanding of our cultural history, and a bit of general science which is generally limited to disciplinary looks at physics and chemistry, and usually, we required an elementary course in the social sciences.

How strange it is, then, that we do not insist that each citizen have some rudimentary knowledge about the ecological systems that sustain us. Some knowledge is necessary as to how the life support systems of the planet works and what keeps the biosphere healthy. Also, as to how our food production systems work, and how the air purification systems work. This deficiency represents, in my own view, a massive flaw in public education, and one so massive and so conspicuous that it is rather difficult in 1970 to understand how we got into this state.

If one harkens back to the nature of the population at the time our public school curriculums were being stabilized, we see that most of the citizens were rural in their origins. Furthermore, the rates at which the human population and technology were then expanding did not appear so awesome. We still had a great deal of the biosphere largely intact. In those times it was reasonable to assume that the average student knew a great deal about food production and the natural state of the biosphere. In other words, the common knowledge students had as they entered or acquired outside school was assumed to be adequate for this facet of the education of our citizens.

Today, one cannot listen to the public media without being confronted with the idea that the earth's life support systems can be placed in jeopardy. Surely we need citizens who are better informed about the nature of the human and natural ecosystems, and most specifically on the fragile nature of these systems. They need to be apprised of the very difficult choices that we will be forced to take, as citizens in a democracy, in the years ahead to make certain that our technology does not irrevocably stress certain of the life-sustaining characteristics of the biosphere.

It is quite obvious that these decisions must stem from knowledge, not from ignorance, superstition or propaganda.

Now, there is much concern today amongst specialists in the environmental sciences and a rather general feeling in the public at large that the current fad concerning the environment will pass, and that just as our concern about soil conservation in the 1930's came, blossomed, and disappeared, and Smoky the Bear became a household friend but has subsequently also essentially disappeared, that this, too, will pass away.

I would like to suggest that concern for the environment will never decline to its former state of low public concern. This is my judgment because for the first time man really is beginning to suspect that he is totally dependent upon the continued good health of the biosphere.

This biosphere is an exceedingly complex system that contains literally millions of different species of organisms, many of which are not yet known, practically none of which are understood in their physiological or ecological relationships, and the interactions amongst the organisms in these systems is largely unknown.

Yet, these systems, which are essentially unknown, which are made up of many organisms which have high sensitivities to modern technology are in fact rapidly shrinking in their total acreage as man's impact on the landscape and seascape increases at an accelerating rate.

In other words, the life-sustaining qualities of the biosphere are in some significant ways dependent on less intensively managed land and sea areas. These aspects of our environmental sustaining machine are being reduced to smaller and smaller blocks, that is, a real process of insularization is underway, and at an accelerating rate.

This, in itself, would be worrisome because the systems that are replacing this old time-tested, life-sustaining system are being designed for far narrower objectives, for example, to produce food, to produce places where aircraft can land, to produce harbors, to produce—you can name the thousands of different very specific manmade ecosystems—and the life-sustaining characteristics of the system which is being displaced are not being built into the systems which displace them. This is an extremely important process that is underway.

So, the insularization is going on. The life-sustaining processes of these systems is being left to smaller and smaller areas. Simultaneously, man is also releasing into the biosphere a half million different compounds each year, many of which had no prior existence on this planet, DDT being an interesting example. Organisms have had no prior opportunity to develop resistances to these stresses.

Now, if we have significant parts of our life-sustaining processes restricted to shrinking islands which are also being subjected to widely diffusing, highly stable, very long-lived compounds which stress their species, this is potentially serious. The case of the persistent chlorinated hydrocarbons pesticides was such a case, and there are many other types of compounds which can stress the remaining islands. In other words, significant parts of the life-sustaining qualities of the globe are being reduced to islands, and simultaneously we are oblivious to the necessity that these be preserved in good health. We release wide-ranging poisons which stress these remaining islands. One could scarcely design a strategy of biosphere management that is less responsible, less permeated with the essential sense of stewardship.

It is an idiotic course that we are on.

I would like to show you an example of pesticide stress on an ecosystem. On page 198 of the reprint I gave you is a diagram showing parts of a complex natural system made up of many thousands of many species. We selected a small number of the interrelationships among the organisms for study. After studying these and monitoring a few of the populations, we then subjected half of the sample areas to stress from persistent pesticides and on page 199 you see the pesticide's impact upon the system. You note that many of the boxes from page 198 are missing. Each of those boxes contained a population that was sensitive to the pesticides.

But the interesting thing is that of the remaining system, several of the components increased drastically. In other words, as one stresses these systems, you not only eliminate things, but for the remaining species you may have interfered with their normal regulatory mechanisms.

The totality of these systems is an elegantly balanced, interacting set made up of many species. The continued good health of the system is dependent upon the persistence of certain of those species which regulate or that keep certain of the populations within bounds.

Now, interestingly, in the particular system illustrated in the diagrams, one of the species increased its population by a factor of five after pesticide treatment. It was a green plant that also happened to be a parasite of pine tree root systems. No one could have predicted beforehand that that species of plant would have exhibited a population explosion as a result of insecticide treatment of the system. There was no way to determine this until the experiments were run. My point here is that with our unmonitored technology we are playing Russian roulette with the remaining islands as we displace the planet's old biospheric system.

This is especially the state of affairs for large pieces of the planet's land surfaces. We are currently engaged in doing the same thing with the Continental Shelf. You are, I am sure, familiar with the marine barrens that have resulted off the shore from New York City where the dumping of secondary disposal plant sludge from New York City has occurred. A recent study of sea bottom there indicates it is a veritable barrens, with few species present, not even the common pollution organisms are present.

The assault is most conspicuous on the terrestrial surface, but clearly present on the Continental Shelf. Now we find DDT present in the Atlantic petrel, a bird that rarely ever gets to land, and it is present in the penguins in Antarctica. No portion of the planet is totally free of the stress.

The biosphere is fragile, we do not know how it operates, and we are in the process of expanding human technology and population, insularizing the original biosphere into ever smaller pieces, and these in turn are being subjected to stresses of unmonitored scope.

We have not yet approached the brink, and it would be misleading for me to say that disaster is at hand. In my own view, it certainly is not. However, if one projects the present rate of technology expansion for very many successive years, we will surely have approached the brink.

The point is, we need to alter or at least forecast better our present course. In a democracy, we have no alternative but to have the public involved when choices need to be made. In order to have the public effectively involved, they must understand what is probably the most complicated group of questions, subject to the greatest range of controversy of any set of issues that individuals have faced in the history of human existence. We must now consider the roles and the health of the literally millions of other species and races of creatures with which we share the planet. We don't know all of their names, we don't know their physiologies or ecologies, and we don't know how the systems they make up operate.

Now, that is the challenge. Can we in fact, in the time that we have left in which to act, get wise enough people to look far enough ahead and to adopt the fail-safe mentality in our technology which will alleviate its most stressful aspects before particular crucial species are driven over the brink of extinction.

It is quite obvious that we are already stressing a large number of species. The California condor is one of the more dramatic ones, our own peregrine falcon, the bald eagle, our national bird, all of these are under considerable stress.

These are big, glamorous species but far less conspicuous organisms stressed to extinction might hurt our biosphere far more seriously. For example one could cite essential kinds of bacteria that no one is even monitoring in terms of their good health. We have literally millions of unmonitored species, and we know nothing about their stress, these include the essential sulfur and nitrogen bacteria.

One might ask, then, if we don't know very much about our ecosystems how in the world can we teach about them? It is true that we must know a subject totally in order to teach it? Well, I would suggest that if such were a requirement we wouldn't yet have taught mathematics since we are still learning a great deal about mathematics. It has been in school curriculums from the beginning of school. It is quite obvious that one need not know all the answers before instructing the rudiments and concepts of a field of knowledge.

Is there now any activity in this general area of ecosystem curriculum development? Quite obviously there is, and I am probably being redundant in bringing an example before this subcommittee. The science curriculum improvement study, funded by NSF is one such case, and there are others. We are not totally without effort in public school curriculum development. There is also growing activity in the public media, for instance in the January 26 issue of Newsweek, there is a rather nice beginning for general public information on the ravaged environment.

The other day I received in the mail a number of copies of a comic magazine that also addressed itself to this set of issues, and as I understand the editor's intention, they hope to continue in this general vein.

Thus, it would be misleading to say that the present level of activity is zero. It is not. The question is, is it adequate? Are we in fact giving this a high enough priority in view of the very important decision the public will be called upon to decide?

Let me suggest, as is often the case in stress situations, we may find that before the actual events themselves cause the damage, early perception by the more alert individuals who understand a bad course of action will trigger them to various sorts of action. As provost of Michigan State University, I frequently observe students moved to violent action by what they pereceive to be inaction by the university or society in general. The point is that our urgency relative to environmental quality questions should be directed especially to the young. Their accurate perception of the state of affairs is essential. They need to know much more about our ecosystems than they now know so that they not be persuaded that the situation is worse than it is. They certainly are entitled to be "turned off" by the inertia, the tremendous inertia that large technological countries continue to exhibit in addressing themselves to these environmental matters.

My point, then, is that we do need additional effort and energy in this direction. What should its content be? It would be presumptuous of me to pretend that I have anything remotely resembling an adequate understanding of actual curricular changes that are necessary. However, a number of years ago as the public affairs committee of the Ecological Society of America was looking at places where one might attack these educational needs, we were made aware of how difficult it is to make change in any public education system. The inertia is enormous. Public school systems have a vast number of teachers who are comfortable in their present curriculums; they don't want to see their courses displaced, and one cannot possibly add an additional course to the curriculum. In other words, for whatever is added, something must be taken out. Obviously, what we are going to need is change in existing courses, at least in the beginning.

Now, as this committee searched around for some place where this totality of man's relationships to his ecosystems could be incorporated into existing courses, one of the areas that occurred to Dr. Bormann at Yale was the public school home economics curriculum. Here, after all, was a body of knowledge, a teaching of concepts that went right to the heart of the matter, or at least could if it were redesigned in the correct way. The home economics course could teach the concepts of the home as an input-output system. Thereby each individual student could relate quantitatively and processwise to his environment in a very personal way. He could be made aware of where his foods come from, what types of agricultural lands are necessary to produce them, and why a citizen of Michigan is dependent on the citizens and the good health of south Florida ecosystems for his fresh vegetables, how he is coupled to watersheds, river and lake systems, airsheds and distant pest-producing areas. National issues often require local individuals to be able to relate to distant situations.

Furthermore, I would suggest that any revision of the curriculum must be couched so that the student in the core city, the suburbs and on the farms all relate to it. If any of these groups fail to see their relationships to the total system it is doomed to failure. We are largely an urban population. We cannot talk about pristine mountain lakes or the sea without relating them in a very real way to the individual in the ghetto, the suburb or the farm.

Somewhere this new curriculum content has to begin with the home as an input-output system, so that watersheds, food production areas.

atmospheric purification processes, waste disposal systems can be related to each individual. He is in fact coupled to his universe, and he needs to learn that he is coupled to undisturbed portions of the biosphere which process his oxygen supply and keep the nitrogen and phosphorous cycles functioning.

I have gone on far too long here, and I apologize. I would like to insert in the record a letter that will cover a major area that I have not touched upon. I have no firsthand knowledge of current details of public school curriculum content and how one changes it. I have asked a specialist in the Michigan State University Science and Mathematics Teaching Center to read your bill and comment on it, and I will insert the remarks of Dr. Wayne Taylor.

Thank you.

(The letter follows:)

MICHIGAN STATE UNIVERSITY,
East Lansing, Mich., April 3, 1970.

JOHN E. CANTLON,
Provost, Administration Building, Campus.

DEAR DR. CANTLON: Thank you very much for the opportunity of reacting to the proposed bill on "Enviromental Quality Education." Although we have not had time for an extensive discussion, I have raised some questions with other members of the Science and Mathematics Teaching Center staff in terms of the general coverage and philosophy of the proposed bill. The following observations, then, should not be construed as representing consensus of our group since we have not had a formal meeting in which to debate the issues at length. I am indebted to the stimulating ideas presented by Professors Berkheimer, Chaffee, Enochs, and McLeod, members of the Science and Mathematics Teaching Center staff.

Certainly the topic is a timely one and the general trend in public school science teaching is toward increased emphasis on environmental quality and study of ecology. There is a real danger in adopting a hysterical approach to the complex problems being generated by our current society. I certainly am in agreement with section 2a of H.R. 14753—present curricula in science and social sciences certainly do not address themselves to an in-depth study and understanding of the problems.

There is a very real danger, in connection with section 2b, that new and improved curricula may be generated and produced but that implementation will not occur. In our experience National Science Foundation curricula produced since 1957 for both elementary and secondary schools have not been universally acceptable. There are probably a number of reasons for this lack of adoption. Among these are lack of teacher background in the curriculum materials themselves, lack of adequate facilities and equipment for implementing the programs (many such programs require special apparatus and materials that have not been commonly used in schools), lack of parallelism of goals of the curricula and goals of the schools (e.g. emphasis on abstractions and presumed college preparatory content), and in already over-crowded school programs. Needless to say, the effectiveness of any curriculum program lies in the dedication and expertise of the teacher, as well as the classroom climate developed by the teacher and the school.

One of the fundamental lessons of the massive curriculum study programs completed to date is that teachers of the material at the level for which the material is intended should be involved from the very beginning of the development of such material. Experts in content and experts in preparation of educational material must also be involved. Implementation by single districts or schools is likely to be ineffective unless adequate provision is made for adequate external supervision and evaluation.

In my opinion the materials are more likely to be used if they are designed to be incorporated into existing programs rather than developed as separate new course programs. I hasten to add that I do not imply the latter course of action is not productive; it is a problem of a higher order of magnitude. In either case it is mandatory that training programs accompany the development and dissemination of the new curriculum materials.

There tends to be a cyclic approach to education; you will recall the tremendous emphasis on "Conservation Education" in the thirties. A great many benefits were derived from this movement, but permanent change did not result. In my opinion these inadequacies were caused by superficial approaches to the problems. In our present society education is concerning itself with the process approach and inquiry thinking. Conceptual ideas rather than isolated information is the order of the day. These emphases reinforce the idea of interdisciplinary attacks on problems and, in my opinion, provision should be made for use of new technology and team teaching techniques for education for environmental quality. In current educational language it is imperative that attention be given to the affective domain in addition to the cognitive domain in terms of the material prepared and the teaching that occurs.

Turning from the substantive material involved, I should like to react briefly to the uses of funds. It seems to me that although there were many very fine results derived from the NDEA programs that a great deal of the money was not used efficiently. Unfortunately many public school and community agencies do not have the necessary expertise to develop sound teaching materials nor in many cases do they understand implementation of programs. Getting a grant, implementing a program, and massing teaching materials that remain on the stockroom shelves tend to be status symbols rather than educational innovation. Therefore I would recommend that any public school programs or grants to such schools take into consideration utilization of professional staff from state departments of education, universities and colleges, and appropriate federal government agencies. Emphasis should be placed on well spelled out plans of preparation, procedure, and evaluation. Materials should be field tested at each stage of development.

I trust that my brief series of opinions and suggestions will be of some value for your reactions to H.R. 14753. Thanks for the opportunity and if I can be of further service please let me know.

Sincerely,

WAYNE TAYLOR,
Professor and Acting Director,
Science and Mathematics Teaching Center.

Mr. BRADEMAS. Thank you, Dr. Cantlon. The first question I was going to ask you touches on the field of curriculum development. You remarked on an NSF curriculum improvement study. I am not familiar with that. Is that generally in the field of environmental studies?

Dr. CANTLON. That is one of the components, but that is not the only thing. An example I have here includes the concept of "eco systems" as part of the curriculum material. It has various additional concepts such as the idea of organisms, material objects, life cycles, populations, environments and communities. These materials are being designed for a wide area of curriculum but environment and ecosystems are not the sole direction of that study.

Mr. BRADEMAS. I take it you are in general agreement with one of the fundamental purposes of this bill, which would be to provide support for curriculum development clear across the range of environmental studies and, second, that you would agree that we need to encourage such studies in elementary and secondary schools?

Dr. CANTLON. Yes, absolutely. I think that, like instruction in mathematics, one needs to start at the lowest grade level.

Mr. BRADEMAS. What about the problem to which Dr. Steinhart, who testified yesterday, addressed himself in his report to the President's Environmental Quality Council, namely, the problem that in our university faculties in this country at this time, there is so much insistence on sovereignty within each faculty that there is lacking a multidisciplinary, problem-oriented approach to the whole environmental issue.

I am sure that is not the problem at Michigan State University.

Dr. Cantlon. As provost, I do have to contend with it.

It is true, that problems of jurisdiction and feelings of priority do exist. However, partly in response to the disenchantment of students, and especially the bright young professors, faculties, as slow as they are to change, are in fact changing.

We have, if you reflect on it, a number of multidisciplinary activities that are long-established traditions in American universities. The schools of medicine represent a multidisciplinary approach to a set of problems, human health, and these are very old and well established. Colleges of agriculture are multidisciplinary operations. Chemistry, economics, biology, and engineering are brought to bear on food production. Concern for multidisciplinary problems isn't of itself new. What we lack is multidisciplinary, problem-oriented look at the totality of things. We look at agriculture in a multidisciplinary way, and have at Michigan State since 1855. We look at health this way also. The problem is that what we do in agriculture, industry, and government influences the health of individuals, of societies and the biosphere of the planet.

So my point would be, true, faculties are in narrower operations in parts of the university, but in every one of our land-grant institutions we have a tradition of using a multidisciplinary approach to problems. No one had posed this concern about the biosphere convincingly until recently and thus we don't have extensive coordinated expertise in it, but we are building.

Mr. Brademas. Yesterday, we were talking to Dr. Margaret Mead about her suggestion that we needed for purposes of educating people in the whole environmental field to establish models. She suggested, for instance, the use of islands, but we asked her to comment, and I would invite you to comment, on the possibility of utilizing the computers to simulate a wide variety of variables and thereby enable us to know rather rapidly what the impact of diverse interventions in the ecosystems would be on population, employment—well, one can rattle off a whole litany of events.

Dr. Cantlon. Yes. I think two points need to be made here. Computer simulation is only as good as the information you put in the computer. We are dealing with systems that have so many components there is now no computer built, indeed no lash-up of existing computers, that would have the capacity to handle even a modest size ecosystem in its totality.

In other words, we are dealing with numbers of variables here of a very, very large size. We have not yet tackled a problem of this scope by simulation. As in that diagram I showed you, on pages 198–199 of the Brookhaven Symposium, what we do is to pick out some subset of a system and test it. We can do that.

Margaret Mead's suggestion that we use islands and simply stress the island and study the behavior of the total island as a unit has virtue; it is a real system. It has all of the components, and while we never have neither the man-hours nor the expertise to monitor every species population present, we can begin looking at the health of that system as a totality. The insular example represents a good empirical experimental approach.

I suspect that the research techniques we will be evolving will be many. Of these, the current U.S. portion of the international biological program dealing with biomes such as the grasslands studies in Colorado represent one major effort at looking at full-scale examples of large systems.

Some of the IBP biome study units are relatively pristine and untouched, some involve a great deal of man's influence in them, as for instance the grasslands beef production studies.

These are research approaches, but it seems to me for educational purposes, especially for public school and mass media purposes, these research studies will remain rather esoteric things, essential for acquiring new knowledge, but for effective education we need a way for each individual to visualize himself in one of these complex systems.

So, this idea of trying either, through simulation or through describing existing situations, to describe the individual's home as an input-output system coupled to diverse other systems would be one of the ways that I think might be more effective.

Mr. **Brademas.** Thank you.

Mr. Landgrebe?

Mr. **Landgrebe.** I have appreciated your statement, and I feel that I have gotten some very good thinking and some good ideas from it. I am not sure that I have any real worthwhile questions.

You talk about a fad, and there is a lot of discussion at the present time. Have we not, as these technological acts came upon us, haven't we had a lot of study and work done, sewage treatment plants and so forth? There has been a lot of thought and a lot of money spent in the past on this, has there not?

Dr. **Cantlon.** Yes, that is correct. The way in which we have approach our environmental problems, though, has been a highly unitized approach. Currently we worry about phosphorous in the secondary effluent coming from our disposal plants. Earlier on, we didn't even have a secondary treatment process and we worried about the biological oxygen demand of primary effluents. The effluent leaving a secondary treatment plant still contains the phosphorous and the nitrogen and the potassium which now results in the rapid growth of algae in our lakes and streams. These are the same elements we buy to fertilize crop land. The point is that we have in most of our approaches taken a very unitized approach, solving one problem at a time, often thereby displacing it as a different problem occasionally some distance away.

Let me suggest that much larger problem arrays are going ultimately to provide more powerful approaches to the problems. Let's look, for instance, at what seems to be an unrelated pair of pollution problems.

Heat pollution from power generation is currently producing a lot of concern for aquatic biologists and conservationists. What do we do to dissipate this gigantic amount of heat, really a low-grade energy, that results when we cool reactors? The usual cooling technique is a water system, and the discharged warm water creates problems for temperature sensitive fish and other organisms.

The engineers have been drawn in locating and siting power generators—whether atomic reactors or the fossile fuel type—to places where there is abundantly cold, pure water, pure water reduces maintenance in the pipes and jackets of the cooling system.

Now, if you think about sites with cold, pure water, they turn out to be trout and other game fishing waters in most of the Northern climate. There is no quicker way to have the power generating industry run head-on into both the fishermen and the conservationists. It would make a lot more sense in cooling generators to look for waters of lowest public concern. Now, you can't get any lower in public concern for water than the discharge of a city's secondary effluent. There ought to be a lot more research in how to use this dirty water in generator cooling, and in the process use the low-grade energy to assist in cleaning up the water. The cooling contribution can be an economic incentive to clean up the water.

What I am saying is that our approaches have been so fractionalized that we often don't really solve problems. We displace them—occasionally creating worse ones.

Mr. LANDGREBE. I certainly can't argue with that. There are lots and lots of things that can be done, but are we moving along to face these problems? Of course, I know you are smiling, and I knew you would smile on that. In this world, there seems to be a constant battle for the dollar, and sometimes we put off until we need to do things those things which are necessary.

This matter of pollution, you talk about making this part of the home ec course. In my school days, we considered this to be a part of the health classes. Do you have some suggestion of how we can approach and get the cooperation of folks of all ages in becoming better housekeepers and being responsible?

In other words, we see just as an example, people who empty their ashtrays on the lot at the drive-in family stand and things of this kind. How in the world will we ever approach these matters with individual responsibilty, a term that you used yourself?

Dr. CANTLON. In the first place, like any kind of ethical or moral question we do a very poor job of this in public schools. Morals, I think, really have to begin in the home. I would say the first side of responsibility will have to be with parents, and there is every evidence that we have been pretty lax in this. This is not to say that we can't build a better ethical phrasing of men's stewardship and responsibility for the atmosphere in the way we present materials in public school curriculum. We have tended to err on the conservative side, we have been too loath to intrude the ideas of ethics and morality in our consideration of science and technology generally.

Mr. LANDGREBE. I am happy to hear you make that statement, and I hope it will go into the record underscored, because I have had one particular contact with a situation where people who actually had garbage service at their door in town would take their garbage out and scatter it along a country lane.

I think that ends my questions, thank you.

Mr. BRADEMAS. Thank you, Dr. Cantlon, for being with us today. I hope you will give my best wishes to your new president out there.

Mr. BRADEMAS. We have five more witnesses this morning, and the Chair would like to suggest that they come forward and, to the extent possible, summarize their statements. All of them will be included in the record. If you feel you want to read your entire statement, that is all right also, but we want to put questions to you, and I think we might do it by inviting everyone remaining to come forward and we shall hear you as a panel, as it were, and we would like to hear first from Mrs. Donald Clusen, chairman of the water resources committee of the League of Women Voters. Then we will hear from Dr. Stahr, and Mr. Dustin, and Mr. Clapper, and Dr. Smith, in that order, if that is agreeable.

Gentlemen, won't you come forward and join Mrs. Clusen.

Mrs. Clusen, we are pleased to have you here. Why don't you go ahead.

STATEMENT OF MRS. DONALD CLUSEN, CHAIRMAN, ENVIRONMENTAL COMMITTEE, LEAGUE OF WOMEN VOTERS

Mrs. CLUSEN. I think my remarks do not exceed a very few moments, but I will do some summarizing and will request that the full text be entered into the hearing record.

(The statement follows:)

STATEMENT OF MRS. DONALD E. CLUSEN, VICE PRESIDENT, LEAGUE OF WOMEN VOTERS OF THE UNITED STATES

The League of Women Voters of the United States welcomes the Subcommittee's invitation to comment on H.R. 14753—an act to authorize the U.S. Commissioner of Education to establish educational programs to encourage understanding of policies and support of activities designed to enhance environmental quality and maintain ecological balance. Because the League is not an educational institution as such, I shall not comment on matters of school curriculum, but I do appreciate the opportunity to express League thinking on the need for more and better education of both adults and children on environmental problems. It is to these two points that I should like to address my comments today.

The League of Women Voters has had first hand experience in attempting to create public awareness of environmental problems. We have long recognized the urgent need for more attention to policies, programs, and funds that would serve as incentives to both layman and educator in building increased understanding and awareness of environmental problems.

If this kind of education had been a basic part of the curriculum in every school during the last generation, perhaps the environmental problems that face us now in crisis proportions would not be so pressing. If adequate attention had been given to making citizens aware and concerned about deteriorating air and water quality, perhaps the task of awakening people to the problems now before us would not have taken several decades.

In spite of the current rhetoric, a large segment of the public still does not fully understand the dimensions and urgency of our environmental crisis and the threat it represents to the quality of human life. What is even more alarming is that among those who do recognize the problem there seems to be a growing feeling of frustration and helplessness about whether current downward trends can be reversed.

League members have a great deal of faith in educational processes generally; we believe that most national problems are aided by intensive public information efforts. Indeed this is the basis of our existence as an organization—"let the people know, make the people care, help the people act." It seems to us that the Environmental Quality Education Act attempts to do just this—to arouse both students and their elders to an understanding of the physical world in which they live.

An important facet in communicating with the young nowadays is not to seem to be super-imposing solutions and information upon those who wish to seek their own destinies. Therefore, it is essential to realize the full thrust and power of the activism of the young in the environmenteal field at the present time. In a few days from now, nearly every college campus and hundreds of high schools will be involved in demonstrating to government and private enterprise alike the disgust which the young feel at present environmental conditions. League members across the country are cooperating with campus steering committees for Earth Day to provide speakers, materials, and funds for this unusual occasion. Our members tell us of their great concern that this activity be followed up after April 22 by a continuing program of education and communication with young people so that the momentum and interest will not be lost.

In a recent article in *Harper's*, John Fischer quotes a University of California student as saying, "It gets pretty depressing to watch what is going on in the world and realize that your education is not equipping you to do anything about it." The Environmental Quality Education Act could serve as an indicator that the federal government does intend to do more in the future than it has in the past to see that youth of the present and the future mature with greater wisdom about their environment than did past generations. In many ways the climate could not be better for using H.R. 14753 to prove that the "establishment" has understood the message of Earth Day and intends to try to bridge the gap between rhetoric and performance.

Section 3, subsections (3) and (4), of the proposed Environment Quality Education Act (H.R. 14753) are of special interest to the League of Women Voters in their designation of possible grant recipients as "other public and private non-profit organizations" to provide "workshops, institutes, seminars, and conferences" for "community education on environmental quality and ecology, especially for adults."

Since 1964, the League and its Education Fund have been engaged in citizen education seminars on land and water use under funding from a federal agency. During a 5-year period, conducting three seminars each year, League members have visibly demonstrated in every region of the country the means and the value of confronting citizens with basic information on water quality problems and alternatives for solving them. Thousands of citizens have participated in our environmental education projects, in which plans for follow-up activity are an essential ingredient. We believe that to mobilize people to work individually or collectively to stem the tide of environmental degradation—to keep our land livable—citizen organizations must provide their members and the public with environmental education. Our League experience has permitted us to see not only what can be done in adult education on environmental issues but how much more needs to be done.

In the 14 years that the League of Women Voters has been working on water resources (in the home communities of 1300 local Leagues, in the 50 states, Puerto Rico, and the Virgin Islands, and at the national level) we have learned that people want information about how undesirable conditions can be improved. It is not enough to tell only how bad conditions are and how much worse they will become. People want to know what improvements are technically possible, what choices they have, and what the alternatives will cost communities and individuals. Adults seek to learn what they can do, within the established governmental system, to promote working with nature rather than against her.

For adults no less than for children and young people it is important to "encourage understanding of policies and support of activities designed to enhance enviornmental quality and maintain ecological balance." Most of the choices for land, air, and water use are made at the local and regional level. Therefore this is the place to imbue people with a desire for constructive change. Voters need information applicable to their own localities, information that makes issues clear in terms of the general values and social objectives of the community and the region.

We in the League have found that people want to put what they learn to work; they want to achieve improvement. Therefore environmental education for adults must be action oriented. Yet adults need help in how and where to express their views to those who have the power and responsibility for decision-making.

Everywhere there is actual or incipient local leadership for environmental quality. But local leaders may need help in learning where they are, where they want to go, and how to get there. It is important to equip local leaders with an understanding of interrelationships between air, water, land, sea, plants, animals, and man. It is equally necessary for local leaders to combine concern for cities and for open country.

Helping to develop such leadership is a role I see for citizen organizations in the years ahead. There exist private, non-profit organizations with great ability to help in adult education on environmental matters. These organizations have an entry into the community; their members are known and trusted. They have the contacts to bring in stimulating people with wider experience and different viewpoints. Many non-profit organizations could do more than they are now doing. What private, non-profit citizens organizations usually lack is the money to enlarge their educational work.

I feel confident, from my experiences as chairman of the League's national water committee, that vital public support for wise, long-range environmental management will develop more rapidly if some aid is available through federal grants for citizens organizations to extend somewhat the adult education work they are already doing in this field.

To summarize: The major problem in environmental education is the problem of reaching all voters—both present and future. We won't be successful in solving our national problems with only part of our population informed. We need a systematic plan to reach all who are in school. And we need a program of adult education as well. Educational projects carried on by non-profit citizens organizations have proved to be important means of adult education and are worthy of support.

Therefore because environmental education can be the catalyst to a citizenry able and willing to meet the threat posed by our ravaged environment, the League of Women Voters of the United States supports the purpose of H. R. 14753 and similar bills.

Mrs. Clusen. The League of Women Voters of the United States was glad to receive this invitation to comment on the Environmental Quality Education Act. I really am not ready to comment on matters of school curriculum, but I do appreciate the opportunity to tell you what the league thinks about the need for more and better education of both adults and children on environmental problems, and it is to this point that I would like to address my comments today.

The League of Women Voters has had some firsthand experience in attempting to create public awareness of environmental problems. We have long recognized the urgent need for more attention to policies, programs, and funds that would serve as incentives to both layman and educator in building increased understanding and awareness of environmental problems.

If this kind of education had been a basic part of the curriculum in every school during the last generation, perhaps the environmental problems that face us now in crisis proportions would not now be so pressing.

If adequate attention had been given to making citizens aware and concerned about deteriorating air and water quality, perhaps the task of awakening people to the problems now before us would not have taken several decades.

In spite of the current rhetoric, a large segment of the public still does not fully understand the dimensions and urgency of our environmental crisis and the threat it represents to the quality of human life. What is even more alarming is that among those who do recognize the problem, there seems to be a growing feeling of frustration and helplessness about whether current downward trends can be reversed.

League members have a great deal of faith in educational processes, generally. We believe most national problems are aided by intensive public information efforts. Indeed, this is the basis of our existence as an organization. We are fond of saying, "Let the people know, make the people care, help the people act," and it seems to us that the Environmental Quality Education attempts to do just this—to arouse both students and their elders to an understanding of the physical world in which they live.

An important facet in communicating with the young nowadays is not to seem to be superimposing solutions and information upon those who wish to seek their own destinies. Therefore, it is essential to realize the full thrust and power of the activism of the young in the environmental field at the present time.

A few days from now, nearly every college campus and hundreds of high schools will be involved in demonstrating to Government and private enterprise alike the disgust which the young feel at present environmental conditions. League members across the country are cooperating with campus steering committees for Earth Day to provide speakers, materials, and funds for this unusual occasion.

Our members tell us of their great concern that this activity be followed up after April 22 by a continuing program of education and communication with young people so that the momentum and interest will be lost. In a recent article in *Harpers*, John Fischer quotes a University of California student as saying, "It gets pretty depressing to watch what is going on in the world and realize your education is not equipping you to do anything about it."

The Environmental Quality Education Act could serve as an indicator that the Federal Government does intend to do more in the future than it has in the past to see that youth of the present and the future mature with greater wisdom about their environment than did past generations.

In many ways, the climate could not be better for using House Resolution 14753, to prove that the establishment has understood the message of Earth Day and intends to try to bridge the gap between rhetoric and performance·

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Thousands of citizens have participated in our environmental education projects in which clients for followup activity are an essential ingredient.

We believe that to mobilize people to work individually or collectively to stem the tide of environmental degradation to keep our land livable—citizen organizations must provide their members and the public with environmental education. Our League experience has permitted us to see not only what can be done on adult education on environmental issues, but how much more needs to be done.

In the 14 years that the League of Women Voters has been working on water resources in some 1,300 local leagues in this country, in 50 States, Puerto Rico and the Virgin Islands and at the national level, we have learned that people want information about how undesirable conditions can be improved.

It is not enough to tell only how bad conditions are and how much worse they will become. People want to know what improvements are technically possible, what choices they have, and what the alternatives will cost communities and individuals. Adults seek to learn what they can do within the established governmental system to promote working with nature rather than against her.

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We in the League have found that people want to put what they learn to work. They want to achieve improvement. Therefore, environmental education for adults must be action-oriented. Yet, adults need help in where and how to express their views to those who have the power and responsibility for decisionmaking.

Evereywhere there is actual or incipient local leadership for environmental quality, but local leaders may need help in learning where they are, where they want to go, and how to get there. It is important to equip local leaders with an understanding of interrelationships between air, water, land, sea, plants, and animals and man. It is equally necessary for local leaders to combine concern for cities and for open country.

Helping to develop such leadership is the role I see for citizen organizations in the years ahead. There exist private, nonprofit organizations with great ability to help in adult education on environmental matters. These organizations have an entry into the community. Their members are known and trusted. They have the contacts to bring in stimulating people with wider experience and different viewpoints.

Many nonprofit organizations could do more than they are now doing. What private, nonprofit citizens organizations usually lack is the money to enlarge their educational work.

I feel confident from the League's experience that vital public support for wise, long-range environmental management will develop more rapidly if some aid is available through Federal grants for citizen organizations to extend somewhat the adult education work they are already doing in this field.

The major problem in environmental education is the problem of reaching all voters, both present and future. We won't be successful in solving our national problems with only part of our population informed. We need a systematic plan to reach all in school, and we need a program of adult education as well.

Educational projects carried on by nonprofit citizens organizations have proved to be important means of adult education and are worthy of support. Therefore, because environmental education can be the catalyst to a citizenry able and willing to meet the threat posed by our ravaged environment, the League of Women Voters of the United States supports the purpose of H.R. 14753 and similar bills.

Mr. BRADEMAS. Thank you very much indeed, Mrs. Clusen. I think what I would like to suggest is that we hear from each of you individually and then put questions to you en bloc.

Dr. Stahr, I am especially pleased to welcome you to our subcommittee today, as a former distinguished Secretary of the Army and the president of Indiana University in the home State of my colleague from the second district and me, and as a friend and distinguished educator.

STATEMENT OF DR. ELVIS STAHR, PRESIDENT, NATIONAL AUDUBON SOCIETY

Dr. STAHR. Thank you, Mr. Chairman, for those kind words. I am delighted to have been asked to testify here today, and two of them you have alluded to. It is nice to see you and Congressman Landgrebe again.

Mr. BRADEMAS. I might interrupt and say for the record that when I first thought about putting this bill together, which I suppose was nearly a year ago, I kept my eyes and ears open for ideas. And, without any question, one of the most valuable sources of both information and inspiration to me was the splendid address you gave some months ago to the New Jersey State Audubon Society meeting at Cape May.

Dr. STAHR. Thank you, Mr. Chairman. That makes me hope all the more that the bill passes. I'll summarize my testimony now, as you suggested, and offer the full statement for the record.

As president of the National Audubon Society, I approach these hearings with pride. I have only been its president for about a year and a half now, but this organization has been in the conservation-education work probably longer and, quite possibly, to a greater degree than any other private group. It goes back at least to 1910, when the first Audubon Junior Clubs, as they were called, were organized in American schoolrooms. Jumping for brevity to 5 years ago, a time when the word "ecology" was almost never seen in the papers and scarcely was heard outside of some scientific circles, and a great many scientists, I might add, were ignorant of it, and a time when most college curriculum planners were still shying away from it as too difficult, National Audubon dared to introduce fifth through eighth graders to the concept as well as the word.

As a matter of fact, Mr. Chairman, I would like to show the members of the committee copies of the ecology program that we have been distributing in increasing volume since 1965. It is widely used in elementary-grade classrooms, by Cub Scouts and summer camps for children, and so on. We brought along about 15 of these, and I would like to ask, if possible, for the staff to distribute them to the members of the committee to peruse at their leisure. I think you will find them interesting and perhaps helpful.

Thirty-four years ago, National Audubon pioneered another technique in environmental education, summer ecology workshops for adults, especially teachers. These were and are called Audubon Camps. We have four of them now in different sections of the country. I wish we could support many, many more.

It happens that the man who organized the first such workshop, recruited its staff, and directed it every summer for 22 years, is with me today. He later became president of the society, and he is my predecessor, Dr. Carl W. Buchheister. I asked him to come here, Mr. Chairman, to assist me in answering any questions that you may have about the ecology workshops for teachers or other kinds of programs. I think his experience in this field is not only rich but it is unique.

I have brought along also our director of educational services, Mr. Duryea Morton, who supervises not only our camps but also our nature centers.

We operate four of these educational nature centers. Primarily they are for children, who come with their teachers in classroom groups, usually in their own school bus, for learning experiences under the guidance of expert teacher-naturalists.

We try to make ours model centers, and we constantly strive to devise new techniques for teaching natural history and ecology and instilling an awareness in young people of man's dependence on nature's processes.

Another point of key importance is that Mr. Morton has been working closely with the science advisors in the New York City school system. Most of America's population is now urban, and it is vital that urban children have an appreciation of these matters. We have just developed in conjunction with a number of New York City teachers a textbook for urban children, which is in press. I couldn't bring copies, but I brought along a brochure about it. I would like to have copies of that left with you as well.

We also train teacher-naturalists at our nature centers. We go beyond that and have a special staff which does nothing but help communities and schools plan nature centers for themselves around the country. They have planned dozens of centers in all parts of the country and at least two abroad, and yet the need for many, many more is, I think, obvious to all who are concerned with the subject matter of this bill.

We would like to propose an amendment, in connection with what I just said, to H.R. 14753, because we have become so convinced of the value of ecological study centers as tools for teaching both children and adults that we think the program of grants ought to include assistance in establishing such centers. This could be accomplished by inserting after line 10 on page 4 a new paragraph, which I shan't read, because it is included in my written statement.

I have a couple of other quick comments on the text of the bill.

We approve the concept of the advisory committee as proposed in section 5. I think it can be of great service in policy review, program planning, and guidance, of great service to the Secretary in the administration of the program.

But we are inclined to think it would be cumbersome and inefficient to charge such an advisory committee with such an administrative function as reviewing all applications for grants and making recommendations on them. While ad hoc committees are used extensively, and would be an alternative, in this instance I would suggest that it would be adequate and desirable to have applications reviewed by the staff and approved or disapproved by the Secretary on the basis of policy guidelines developed by the Secretary with the advice of the committee that is provided for in section 5(a)(1).

So we would recommend deleting paragraph 3, lines 17 and 18 on page 6.

Finally, by way of specific comment, we strongly urge that you consider rewriting section 9 to authorize appropriations to carry out the purposes of the act for at least 5 years. The kind of program that we are dealing with here is too fundamental and too far-reaching in its potential benefit to launch it with such a tenuous hold on life.

The environmental crisis, if it calls for anything, calls for boldness in education as well as in other approaches, and especially, I think, in education. This has much to do with the development of people's values, a topic that Congressman Landgrebe and Dr. Cantlon were talking about a few minutes ago. People's values really determine what they want and demand, what they want and demand of government, industry, and of each other as citizens. It is because, I think, our values have been too uninformed and thus too narrow and shortsighted in ecological terms that we Americans have made the demands which have led to the degradation of our environment.

In short, Mr. Chairman, I believe that environmental education is essential if you are really going to solve and keep solved this problem of our environment, the problem that stems from the combination of the population explosion, poorly planned urban and industrial development, outmoded transportation policies, and pollution from a multitude of sources.

We think that the purposes for which Federal assistance would be provided under section 3, together with the purpose for which we are recommending an amendment, are needed and soundly conceived.

I mentioned nature centers, and I have a film ready to show the committee at the conclusion of the hearing, which I hope, and indeed believe, will be of genuine help to you. It is called Islands of Green, and it says much more eloquently than I could what this amendment we propose is all about.

Thank you, Mr. Chairman.

(The formal statement referred to follows:)

STATEMENT OF DR. ELVIS J. STAHR, PRESIDENT, NATIONAL AUDUBON SOCIETY

I appreciate the invitation to testify at this hearing. I regard it as not only a privilege but an honor to appear before the Subcommittee on Education of the House of Representatives because as an educator for some twenty years I believe I comprehend the profound significance to America of many of the matters falling within your jurisdiction.

Moreover, as president of the National Aubudon Society, I approach these hearings on H.R. 14753, the proposed Environmental Quality Education Act, with special enthusiasm and a measure of pride:

Enthusiasm because I believe the kind of program envisioned in H.R. 14753 to be essential to lasting solution of the perplexing environmental problems that beset us as a nation and as inhabitants of our biosphere;

Pride because I represent an organization that probably has done more in conservation education, through the decades, than any other single American agency, public or private.

Let me hasten to add that there is no element of personal vainglory in what I have to say about the Audubon Society's record. My own tenure with the Society has been brief. But its record as a major influence in conservation education goes back at least to 1910, when the first Audubon Junior Clubs were organized in American school rooms. The Audubon Junior Program was based on the principle that children who learn to appreciate the wonder and diversity of nature, and who gain some understanding of natural ecology (although the word ecology was not used in the early days), would grow up to be protectors, not destroyers, of wildlife and other natural resources. It was a sound principle. Many of today's leading environmentalists and teachers of ecology will tell you that as twigs they were bent by childhood experiences in an Audubon Junior Club.

Five years ago, at a time when the word *ecology* almost never appeared in the newspapers and was scarcely heard outside of scientific circles—and while most college curriculum planners shied from it as too difficult—National Audubon dared to introduce fifth through eighth graders both to the concept and the word. I should like to show the Subcommittee, Mr. Chairman, copies of the Audubon Ecology Program that we have distributed in increasing volume since 1965. It is widely used in elementary grade classrooms, by cub scouts, in summer camps for children, and other youth groups.

Thirty-four years ago the National Audubon Society pioneered another technique in environmental education—summer ecology workshops offering intensive short-courses in the out-of-doors for school teachers and other adults. They were and are called "Audubon Camps", and we now have four of them: in Maine, Connecticut, Wisconsin and Wyoming. I wish we could support many more. The man who organized the first such workshop, recruited its teaching staff and directed it each summer for 22 years is with me today. He is my predecessor, the former president, now President Emeritus of the National Audubon Society, Dr. Carl W. Buchheister. I asked him to accompany me to assist in answering any questions you may have about ecology workshops for teachers, or other types of environmental education programs. His experience in this field is rich and perhaps unique.

Also with me today is the Society's director of Educational Services, Mr. Duryea Morton. Mr. Morton is now in charge of the Audubon programs for children, the Audubon Ecology Workshops, and our Nature Centers. Let me say some more about Nature Centers. They too are highly relevant to this legislation.

In addition to the summer ecology camps which I mentioned, National Audubon also operates four educational nature centers, primarily for children who come with their teachers in classroom groups for learning experiences under the guidance of expert teacher-naturalists. At each of these "model" centers we strive constantly to devise and perfect new techniques for teaching natural history and ecology, and for instilling an awareness of man's own dependence upon nature's processes and his inescapable relationships to the environment.

Another point of special interest is that Mr. Morton and his staff are working closely with the science coordinators of the New York City school system in the development of an urban environmental study program. With your permission, I would like for Mr. Morton to tell you briefly about the latter program.

We also train teacher-naturalists at the Audubon Nature Centers. The objective is to provide trained professionals to staff the new nature centers that are coming into being throughout the country under the auspices of local agencies. We feel so strongly about the vital role to be filled by Nature Centers—which should be called more precisely "Outdoor Ecological Study Centers"—that we maintain a staff of experts whose sole job is to help communities and schools get such centers started. We call this staff our Nature Centers Planning Division. They have planned dozens of centers in all parts of the country and at least two abroad.

We are so convinced of the value of ecological study centers as a tool for teaching both children and adults basic lessons about environment that we propose an amendment to H.R. 14753.

The purpose is to make clear that the program of grants will include assistance in establishing such centers. This can be accomplished by inserting after line 10 on page 4 a new paragraph as follows:

> (6) Making grants to local educational, municipal, and State agencies and other public and private non-profit organizations for the planning, acquisition and development of outdoor ecological study centers.

May I make two other comments and recommendations about the text of H.R. 14753?

We approve the concept of an Advisory Committee on Environmental Quality Education as proposed in Sec. 5. In policy review, program planning, and guidance, the Committee can be of great service to the Secretary and to the administration of the program. However, we suggest that it would prove cumbersome and inefficient to charge such an Advisory Committee with such a mainly administrative function as reviewing applications for grants and making recommendations thereon. While ad hoc review committees are by no means unheard of, and would be an alternative, in this instance I would suggest that it would be adequate and desirable to have applications reviewed by staff, and approved or disapproved by the Secretary, on the basis of policy guidelines developed by the Secretary with the advice of the Committee as provided for in Sec. 5 (a) (1). Therefore, we recommend the deletion of paragraph (3), lines 17 and 18, on page 6.

We strongly urge that Sec. 9 be rewritten to authorize appropriations to carry out the purposes of the Act for at least five years. The program proposed here is too fundamental and too far-reaching in its potential benefit to launch it with such a tenuous hold on life. The environmental crisis calls for boldness in education as well as in other approaches. Especially, I think, in education. For this has much to do with the development of people's values—and these in turn determine what they will want and demand—of government, of industry, and of each other as citizens. It is because our values have been too uninformed and thus too narrow and short-sighted in ecological terms that we Americans have made the demands which have led to the degradation of our environment.

In conclusion, Mr. Chairman, the National Audubon Society believes that environmental education is essential to the ultimate solution of America's growing ecological problems that stem from the population explosion, poorly planned urban and industrial development, outmoded transportation policies, unwise chemical assaults upon our lands and waters, and pollution from a multitude of sources.

We believe that all of the purposes for which federal financial assistance would be provided under Sec. 3, together with the purpose for which we recommend an amendment, are needed and soundly conceived.

We have informed our 174 local chapters about H.R. 14753, and through the pages of Audubon Magazine we shall inform all of our 125,000 members. I have not polled them, of course, but I am confident I speak for virtually all of them when I express appreciation for the concepts in this enlightened measure.

Mr. BRADEMAS. Thank you very much indeed, Dr. Stahr.

Our next witness is Mr. Thomas Dustin, the executive secretary of the Indiana division of the Izaak Walton League.

We are pleased to have you here as a fellow Hoosier.

STATEMENT OF THOMAS DUSTIN, EXECUTIVE SECRETARY, INDIANA DIVISION, THE IZAAK WALTON LEAGUE

Mr. DUSTIN. Thank you, Mr. Chairman.

I was not able to distribute a letter from Mr. Joe Wright, who is the conservation-outdoor education consultant for the State of Indiana. One paragraph of his comments:

> The Izaak Walton League has provided: financial support for my position during the past year. This support has helped to pay my salary, purchase teaching materials, and to pay for other curriculum developments. I appreciate your support but feel that, since environmental education is properly an essential part of the public school curriculum, the State and Federal Government must accept more responsibility. H.R. 14753 must be passed if Indiana schools are to be provided the resources needed to effectively implement a good environmental-educational program.

I am representing today both the Indiana division and our national parent organization.

The Indiana division, by formal action of its board of directors on December 7, endorsed H.R. 14753 and its purposes. It was a special privilege of ours to confer at an early date on this bill with the chairman when he suggested the possibility of such a national measure following an address to the State convention of the Indiana Izaak Walton League last June.

At that time was assured our great interest in such a proposal, which was underscored by the league's national president in such a proposal, Raymond Haik of Minnesota, and Robert Herbst, our national executive director, of Glenview, Ill.

In the ensuing months we were pleased to forward background material to assist in the development of concepts for such a proposal.

Since introduction of H.R. 14753 last November 12, we have brought the bill to the attention of the membership of our professional resource chapter in Indiana. This is a unique unit of the Izaak Walton League, consisting almost entirely of life-and-earth scientists in university educational roles in Indiana.

Attached to this statement are certain recommendations with respect to the bill which are the product of conferences and reviews on the original print. I will discuss these a little later.

While the bill speaks for itself in the thrust of section 2, we cannot overemphasize the importance of what is being proposed in this measure. There has never been, to our knowledge, a national policy of educating to an ecological awareness. Most of our efforts have been technological or scientific in nature, and most of that rather vertical in quality. Yet our environmental problems are interdisciplinary and ethical, as much as they are technological. Only the broader thrust of ecology presently approaches the educational needs of our era.

For years we have taught biology, botany, zoology, forestry, resource management, hydrology, and all other fields of life and earth sciences. But, in the main, these have been taught to man as a creature independent of his environment. Of course, we must have these sciences and technologies. But now it is essential that we broaden our scope to include questions that will be far more definitive in the years close at hand.

Now it is necessary that we teach man what the impact of his presence on earth is. The hour is late for us to learn that no matter what we do to our environment, it will react to that stimulus—for good or ill. Now we must learn that man is not independent of his surroundings but is an integral part of it—a link in the chain of life. We must learn more about the interdependencies we share and about the energy cycle upon which all life relies.

Until very recently, almost all of our inventiveness has been directed to the development and consumption of the earth's nonrenewable capital. And while we seem to discover new deposits of this capital which temporarily enable us to stay ahead of the energy deficit from renewable resources, it is patently obvious that there is a limit to this exploitation and that it will be reached—probably sooner than we might imagine.

And while we have continued in the increasingly urgent search for new ways to prop up the availability of energy, we have shown appalling ignorance and carelessness in the waste products of our consumption. These wastes are not only an esthetic blight and a biological disaster, and a rapacious assault upon resources that can never be reclaimed, they are also undermining the environment's capability to restore and rebuilt what we are demanding of it.

The grave potential has been suggested by scientists of eminent credentials in such matters as air pollution, which reduces the amount of sunlight that can reach the earth to catalyze photosynthesis, in contamination of the seas with pesticides which may threaten the action of phytoplankton in oxygen production while destroying the foundation brickwork of the food chain, and dozens of other ecological questions.

Until the most recent times, there has been no serious effort to create a broad educational base on such matters, as fundamental as they are to all life. But H.R. 14753 should do much more than merely quantify the lopsided imbalance between man and nature. Its purpose must be to stimulate an environmental ethic, in which man sees and understands the validity of all features and forms of his earth and in which he sees himself as a partner instead of an adversary.

Much has been said in conservative economics about living within our means. I have no competence to judge the economics of cash or credit in monetary terms, but it should be apparent that living within our means, in terms of the environment, is a matter of survival. We have been borrowing against the future on an exponential curve since the beginnings of the industrial revolution. It can be conceded that for a time it was, and may still be, necessary to borrow on our capital until our capability enabled us to close the loop, recycling most of what we withdraw in a kind of revolving fund. But something went wrong somewhere. We refused to admit that our credit is limited. We have failed to pump back in what we are taking out, except as irrecoverable and inconvertible waste and junk. Man has failed to realize that, in the long run, his activities will be limited by the envimonment, which he is destroying instead of preserving and restoring.

This is not rhetoric or mere play on words. We are faced with the ultimate questions now.

I have hesitated to use the phrase "ecological balance" in suggesting what we think this bill should address itself to. Critics might point with considerable support to a heavy commitment to imbalance. And it is difficult to counter this point.

The healthiest overall environment is a diversified environment, in which all organisms are checked with built-in controls, including other organisms which participate in the food chain. Only if we fail to act within environmental limitations through use of our unique capacity to reason and to work in the dimension of time will ecological balance be fully restored. But it will be restored by forces beyond our control.

These controls are summarized by Dr. Robert O. Petty, a Wabash College ecologist, as the forces of environmental resistance: Food supply and other vital materials, including water and oxygen; intensification of crowding effects, including disease, self-imposed toxicity; social pathology, including aberrant behavior and endocrine imbalance; the reduction in our substrata or living space; and competitive predation. These, of course, relate to the explosion of human numbers—the taproot of all issues of survival and ecological catastrophe. It would be impossible to conceive of the implementation of an Environmental Quality Education Act would not contemplate dealing with this among the basic ecological questions.

But, as I observed, we are probably not dealing with a matter of ecological balance unless we choose to do nothing but let inherent natural forces impose their own limitations. But the purposes of this bill are hopeful purposes. It proposes to do something about our deteriorating condition while a choice is still possible.

If it can be assumed that we want to continue as organized societies of human beings rather than as chaotic victims of environmental resistance, then our search is for environmental and ecological viability. I do not mean to imply here that we should determine the maximum resilience of nature and then exploit it to the hilt.

Mr. BRADEMAS. Mr. Dustin, I am sorry to interrupt you, but I fear we are going to run out of time here. And we have two other witnesses to be heard from. I wonder if you could skip on over. I think the rest of your material, running through the middle of page 4——

Mr. DUSTIN. I think, John, there is probably no need to present the rest of it orally, other than perhaps to comment on section 2 of the bill itself.

Mr. BRADEMAS. Please do that.

Mr. DUSTIN. We support the bill in its present form, but we did have these additional suggestions for a modification in section 2 that we feel may be helpful. And I would just like to read section 2(a) of that commentary.

> Section 2(a). The Congress of the United States finds that the quality of the nation's natural environment and resources has been steadily deteriorating, due in part to insufficient understanding of earth's total ecology by the nation's citizens; that a quality environment must include a condition in which man is in equilibrium with the earth systems and natural communities upon which he depends and of which he is an integral part; and that an ecological viability capable of sustaining all interrelated forms must be restored and maintained if a high quality of life, health, and survival are to be assured. Presently, there do not exist adequate programs for educating citizens in these questions, nor for creating awareness and implementation concepts for restoring and preserving a high-quality natural environment. Concerted national efforts are therefore necessary to create these conditions.

We commend this recommendation to you and the committee.

Mr. BRADEMAS. Thank you very much, Mr. Dustin. I regret we don't have as much time as we would like, but there are a couple of us here who will want to put questions to you.

I wonder, Mr. Clapper, if you will be kind enough to summarize your statement. And I will give the same admonition to Dr. Smith. But, of course, all of it will be included in the record.

(The statement referred to follows:)

STATEMENT OF LOUIS S. CLAPPER, DIRECTOR OF CONSERVATION, NATIONAL WILDLIFE FEDERATION

APRIL 9, 1970.

Mr. Chairman, I am Louis S. Clapper, Director of Conservation for the National Wildlife Federation, which has its national headquarters at 1412 Sixteenth Street, N.W., here in Washington, D.C.

Ours is a non-profit, non-governmental organization which has independent affiliates in all 50 states and the Virgin Islands. These affiliates, in turn, are made up of local groups and individuals which, when combined with associate members and other supporters of the National Wildlife Federation, number an estimated 2½ million persons.

The Federation seeks to attain conservation goals through educational means. Consequently, we welcome the invitation to appear here today to comment upon H.R. 14753 and other bills to authorize the "Environmental Quality Education Act."

We congratulate the distinguished chairman of this Subcommittee and the large number of other House members who have joined in the sponsorship of this proposal. We hope it will be reported to the House and cleared by the Senate in time to be a major accomplishment of this 91st Congress.

Mr. Chairman, we are exceedingly pleased at the new awakening of interest in the environment, as evidenced by the President's recent message and by the introduction in the Congress of numerous bills on various environmental problems. I might say that our Federation and many other non-governmental conservation organizations, as well as governmental agencies, long have endeavored to arouse an awareness on the part of the public to the need for preserving and enhancing the quality of the environment. However, we have been terming this practice as "conservation," or wise use of natural resources.

Many of us have been concerned about use of the term, "conservation," believing it has not always been truly descriptive of the movement. Some people equate "conservation" with preservation rather than wise use. On the other hand, the term "environment" may not be truly descriptive either. In the most basic sense, a person's environment can be his home or office or club. However, with respect to both conservation and environment we are talking about natural resources such as air and water, and fields and forests, and wildlife and the problems of pollution control, solid waste disposal, use of potent pesticide poisons, preservation of natural beauty, and wise management of these assets. We are talking about ecology, or the study of the interrelationships of living things, and their environments.

The National Wildlife Federation long has been cognizant of the interrelationships of these natural resources, including wildlife. The fourth resolution adopted at our first annual convention 34 years ago called for water pollution control. In fact, water pollution probably has had more attention from our organization than any other. It is the only theme ever to be repeated in our annual observance of National Wildlife Week. In years after 1936, the National Wildlife Federation became seriously concerned with air pollution control, reclamation of strip-mined areas, noise pollution, the indiscriminate distribution of pesticide poisons, and all other aspects of environmental contamination. And, last month, our organization went on record as favoring stabilization of the Nation's human population (copy attached).

I might digress here, Mr. Chairman, to point out that most major national conservation organizations have similar objectives. In fact, most are members of a coordinating group known as the Natural Resources Council of America and it is my pleasure to serve as a member of the Executive Committee of this organization. The NRC has an active committee on conservation education and we have been urging that the Office of Education give greater emphasis to this phase of work. Consequently, we are quite pleased at the thrust which H.R. 14753 will give to environmental education. We also are pleased that the Office of Education has established a new Environmental Education Study Staff which is making real progress in stimulating concern for the environment throughout the entire Department of Health, Education, and Welfare.

Before commenting about specific provisions in the bill under consideration, I would like to make a few general observations.

First, we believe that a fundamental change must be developed in the attitude of the public toward the environment. Much of education deals with how, why, and what but not enough on "so-what". Call this a conservation ethic, or moral attitude, or whatever, it must be a desire on the part of the people to not only prevent forest fire and avoid being a litterbug, but to demand that industries clean up their pollution, to insist that bureaucratic Federal, State, and local agencies give proper consideration to all environmental effects in their programs, and to offer solid financial support to projects which will result in a quality type of environment. We are confident that the American public is willing to pay more for environmental protection and enhancement. Last year, the National Wildlife Federation commissioned the Gallup Organization, Inc., to conduct a survey on public attitudes toward the environment. Almost three of every four persons interviewed said they were willing to pay something extra to improve their natural surroundings. We followed this survey up with another by a widely-known and recognized sampling organization. In this case, 52% of those interviewed thought that protection of the environment is receiving too little financial support in comparison to other public programs. Also significant is the fact that the younger age groups of people are the most willing to pay.

Second, we hope that the Congress soon will rearrange this Nation's priorities to give greater emphasis to protection of the environment. The budget proposed for fiscal 1971 is divided into 13 functional categories. Last on the list is natural resources with an allocation of about 1.2 percent of the total budget outlay. The 1970 budget contained about \$2.5 billion for natural resource programs, or equivalent to about one-sixth of the interest we pay on our national debt.

Third, this new awareness to environmental hazards must be considered more than a "fad" which can pass away in a year or so. Every possible encouragement must be given to a continuing program, perhaps through incentives for industries and public resources-management and production agencies to recycle and reclaim their by-products so that "wastes" are held to a minimum. There is no doubt that the life style and attitude of every American must be vastly different in the future. This calls for a drastic change in the educational system as an initial step.

Fourth, consideration should be given to making it mandatory that teachers demonstrate a proficiency in environmental education as a qualification for certification in schools receiving Federal financial assistance. We are well aware that such a suggestion is fraught with dangers of running afoul of educators who carefully guard their prerogatives, and that it may be unwise to attempt to legislate curriculums. We also know that most States either have laws or regulations which require teachers to be qualified to teach conservation. However, all too many educators approach this entirely from an academic point of view and miss the practical applications which are so important. We would hope that the Commissioner of Education can use H.R. 14753 to improve this situation, beginning with teacher training institutions, with any program permeating the whole educational system.

In a basic sense, environmental education involves helping students learn to make sound judgments, ones in which the general welfare must be dominant, and in which they will do the right thing regardless of stress and strain. Like other educational objectives, these develop man-to-man relationships, and man-to-resources relationships, which include matter and energy. Some people believe a man-to-idea relationship also is essential if people are to work in harmony. We must be governed by moral or ethical and scientific considerations in the use, management, and manipulation of materials and forces of nature. These require an understanding of natural laws and processes and an appreciation of these things. Studies and research then must lead to the development of solid information, this to knowledge, and this to understanding and appreciation and finally to wisdom—or wise use of natural resources. A friend of mine, James L. Bailey, Director of Conservation Education for the Tennessee Department of Conservation, puts it this way: he doubts that anyone should have the ability or authority to make rain unless they also have the ability and authority to stop it.

And now I should like to comment specifically about a few provisions in H.R. 14753 under consideration here today.

We are in agreement with the Statement of Findings and Purpose, as outlined in Section 2, and which relate to the deterioration of the quality of the natural environment. If anything, this statement is not sufficiently strong. We believe the situation has become so critical that the national security and man's very survival may be at stake. And, most certainly, we are in agreement with the broad purposes outlined in subsection 2(b). We feel that it is absolutely essential that educational efforts be accelerated and expanded in order to obtain the citizen support which is necessary for implementation of proper resource management programs.

We believe that Section 3 gives the Commissioner of Education sufficient latitude to make grants or enter into contracts for projects or programs which will stimulate education of the public on problems of environmental quality and ecological balance. This section appears to cover virtually all types of educational and/or informational programs and we are particularly pleased to note that provision is made for utilization of the mass media. The National Wildlife Federation has had success in disseminating information through its own publications and via press and radio-TV media and most certainly believes there is a place for such projects in any overall program such as that envisioned by H.R. 14753.

I would also suggest that provision be made in Section 3, or elsewhere, for an Assistant Commissioner to administer this particular program. Its importance merits the close attention of a top-flight administrator.

We would suggest that Section 5, providing for an Advisory Committee on Environmental Quality Education, be strengthened. First, we suggest the name should be changed to imply a decision-making role rather than one of an advisory nature. I say this because of the background of presently serving as a member of the Federal Water Pollution Control Advisory Board set up by statute as an advisory group to the Secretary of the Interior. Responsibilities of the group should be spelled out as being of a decision-making type unless vetoed by the Secretary. Second, composition of the Committee should be spelled out in such a manner as to require enough ecology and education-oriented members to preclude the possibility that vested economic interests would ever get control of the Committee's decisions.

To conclude, Mr. Chairman, the National Wildlife Federation again thanks the Subcommitee for the opportunity of making these remarks. We stand ready to help in any possible way.

OPTIMUM POPULATION LEVELS

WHEREAS, the human population is making ever-increasing demands upon natural resources for food, fibre, space and other basic needs, including outdoor recreation and

WHEREAS, these demands are resulting in an overall degradation of the natural environment through water pollution, air pollution, unwise uses of chemical poisons, losses of natural areas, surface mining, and noise and

WHEREAS, many fear that overcrowding is leading to irrational and destructive behavior among humans, behavior similar to that which prevails among lower forms of life when they are overcrowded; and

WHEREAS, man's very survival may be threatened if the ecosystem no longer can cleanse itself because of environmental contamination;

NOW, THEREFORE, BE IT RESOLVED, that the National Wildlife Federation, in annual convention assembled March 20–22, 1970, in Chicago, Illinois, hereby asserts its conviction that the human population in the United States, as well as throughout the world, has reached the point were it could be stabilized at the current level; and

BE IT FURTHER RESOLVED that this organization encourages the President of the United States to initiate action, both in this country and abroad, which will result in the development of plans and/or programs to curtail the present expansion of human populations.

STATEMENT OF LOUIS C. CLAPPER, DIRECTOR OF CONSERVATION, NATIONAL WILDLIFE FEDERATION

Mr. CLAPPER. Thank you, Mr. Chairman.

Mr. BRADEMAS. Off the record.

(Discussion off the record.)

Mr. CLAPPER. We would like to congratulate the distinguished chairman and others who have cosponsored this legislation.

We are exceedingly pleased that the new awakening of interest in the environment—and I might say we have been at this business for a long time, except we called it "conservation" for all these years. Without getting into semantics, we do think that environment and conservation relate to the natural resources, such as air and water, fields and forests, the problems of waste disposal, and so forth.

Of course, then we are talking about ecology, and this has been discussed at some length earlier in previous hearings.

We have a few specific recommendations or comments to make about some sections of the bill. But first I would like to make a few observations, that first we believe a fundamental change must be developed in the attitude of the public toward the environment. Much of the education now deals with how, why, and why, but there is not enough on, "So what." And this is the conservation ethic which was discussed earlier, a moral attitude. And we believe it must be a desire on the part of the people not only to avoid forest fires and not be a litterbug but demand industries clean up their pollution, and that governmental agencies give proper consideration to all environmental programs.

We hope that the Congress soon will rearrange the Nation's priorities to give greater emphasis to protection of the environment. The budget proposed for 1971 has 13 categories, and the last on the list is natural resources, only about 1.2 percent of the budget.

We are aware that environmental hazards are popular at the present time, but we fear that this can be a fad which will pass away unless some thought is given to a continuing program, perhaps to incentives for industries and public-resource management and production agencies to recycle and reclaim their waste products.

In other words, if waste can no longer be considered waste, this would be an ideal situation.

We believe consideration should be given to making it mandatory that teachers demonstrate a proficiency in environmental education as a qualification for certification in schools receiving Federal financial assistance. We think that this has some merit. And we believe that additional emphasis should be given in this direction.

Now, with some comments on the specific portions of the bill, we do believe that section 3 gives the Commissioner of Education sufficient latitude to make grants or enter into contracts for projects or programs which will stimulate education of the public on problems of environmental quality and ecological balance. We are pleased to note this section appears to cover almost all types of educational programs. And we are pleased with the provision for the utilization of the mass media.

It has been our experience that the public can be reached through press and radio and TV media. And we believe there is a place in this program for this type of thing.

I would also like to leave with the committee some samples of our educational efforts. This is a publication for children, Ranger Rick's Nature Magazine, with a teacher's guide that now goes to 290,000 children on a regular distribution basis.

We have our larger magazine that now goes on a regular basis to 500,000 people. We have a series of publications such as this, "Environmental Education," which was written by a member of the staff of the U.S. Office of Education. These and many others I would like to leave with the committee to consider and utilize.

We believe it would be important for the bill to provide for an assistant commissioner to administer this particular program. We believe it is important and merits the close attention of a topflight administrator.

Finally, we suggest that section 5 providing for an advisory committee be strengthened to provide for some decisionmaking roles rather than being purely of an advisory nature. We believe the composition of the committee should require enough ecology and education-oriented members to preclude the possibility that vested economic interests would ever get control of the organization.

Thank you, Mr. Chairman.

Mr. BRADEMAS. Thank you, Mr. Clapper.

Dr. Smith?

STATEMENT OF DR. SPENCER SMITH, DIRECTOR, CITIZEN COMMITTEE ON NATURAL RESOURCES

Dr. SMITH. Thank you, Mr. Chairman.

It is a privilege to be here and discuss the matter of environmental education. It has been a concern of mine for many years.

Mr. BRADEMAS. Is your microphone on?

Dr. SMITH. I assumed it was. I will use this one.

My own organization, which was established in December 1964, is not indicative of my own concern, which goes back beyond that. Many of us were asking questions as to what the anatomy of the gross national product was a long time ago.

I might add that the leadoff witness this morning placed several things in perspective. I would like to suggest that part of the problem in the field of economics has just been one of contrast. He indicated the approach was unitizing our approaches.

One of the difficulties in the analysis of economics has been the aggregate method of computation. We began to deal in numbers of the gross national product, which had the most sex appeal, so to speak, to economists, consumers, businessmen, et cetera. The gross national product is simply the goods and services valued at market prices in a given year. It covers everything, including the doctor's service as well as a bag of peanuts at the corner grocery store.

It would occur to me that the failure to analyze the anatomy of this gross national product, or to analyze the cost in terms of natural resources, is one of the problems we have today in facing up to our responsibilities. But other problems must be looked at with some care.

We are on a rhetoric kick at the present time. The news media have picked up the concept of "environment." The *Congressional Record* is very interesting reading these days. I can't recall a time when we fail to have at least four to five commentaries by Members on the "environment," which means a general appreciation of the fact that people are also interested in it. I find this happy, and distressing, because to a very great extent many people have already gotten bored with a term they never really understood, namely "ecology."

I suggest that the whole problem of the nature of "ecology" is one of present institutions reordering their priorities. What do we really mean when we say "reordering of priorities"?

Practically all of our laws in regard to natural resources in this country were enacted and stem from the idea of development. The Hard Rock Mining Act in 1872 was not only a directive, but an incentive to individuals to mine and exploit resources. The land offices that sprang up in terms of the opening of the West is another example—and you can go right down the list, Mr. Chairman—irrespective of what particular aspect of the public lands, the national forests, et cetera, and any so-called preservative acts that have come about have been in very recent history.

When you have a situation of the general orientation in the direction of development you have public and private economic and political institutions that reflect this attitude, and are therefore highly resistant to change. Apparently we are going to pave the entire city of Washington, D.C., and then we will come to the conclusion that, having doing so, we haven't solved the transportation problems. But we will have had a considerable effect on our environment.

Therefore, we are going to have to ask some serious questions, "to solve the transportation problem, what are we going to do? Are we going to pave more square feet? Are we going to add more automobiles to those we already have"?

This, I suggest, therefore, Mr. Chairman, is the real crux of trying to get environmental reordering of priorities. When we start to say in this reordering, does it mean (the Full Employment Act of 1946 notwithstanding) will use less capital? Does it mean we will produce less goods? Does it mean we will have to consume less goods?

I don't know the answer to these questions. I am suggesting, however, that in order to achieve an increase in the quality of environment the answers to these questions may very well conflict with the development concept we now have. If this does, then it would occur to me that you do have a serious education problem.

Up to now we have lulled ourselves into this lovely euphoric atmosphere that we have economic machinery which, if we just tinker properly with it, we will achieve the right answers. This assumes our consumption of goods and services will continue to increase much as it has in the last 10, 15, or 20 years, and will also produce a quality of environment. We have had good testimony this morning to the effect that the unknowns involved are significant, and the variables are almost unfathomable. Therefore, we don't know how we are going to have to reorder the demands and technological equivalents upon our resources.

I think, therefore, the urgency of the measure that the subcommittee is now considering is made even greater by the substance of these observations, and I certainly hope that H.R. 14753 will pass this Congress. And I hope, as Mr. Clapper has just said, that it will be to the ever-growing glory of this particular Congress in its passage.

I do also hope one other thing, that if the advisory committee is left as it is, its functions be changed in some fashion. We really haven't thought out the degree or the details, nor do we have specific language to offer the subcommittee to change it.

Candidly, Mr. Chairman, I have grown old in this city serving on advisory committees, which usually gave advice to Secretaries who didn't want it, and Secretaries in most instances were able to get it if they did want it. It was a very interesting socializing affair, and from time to time we aided in obtaining appropriations, or occasionally if the bill or basic legislation was in trouble, we would go to the legislature and bail the water with the rest.

But as far as helping or implementing the program very few of the committees that I have served on accomplished very much.

I would rather see the technical assistance to this program beefed up and strengthened so that it will represent a viable and meaningful program. If you retain the advisory committee, however, then I hope that it is reworked and made more meaningful.

Thank you very much.

Mr. BRADEMAS. Thank you very much, Dr. Smith.

Mrs. Clusen, let me first say how much I appreciate the support of the League of Women Voters on a wide variety of issues, but particularly on water-resource matters over the years. I am glad to say that a new chapter of the league has just been established in South Bend, Ind., so I am hopeful we will get more of the kind of leadership I represent here at the local level in my own home community.

You noted that since 1964 the league has been engaged in citizen-education seminars on land-and-water use, which you said had been funded by a Federal agency. Could you tell us what agency that was?

Mrs. CLUSEN. Yes, we had a number of grants. But the one I had reference to was from the Federal Water Pollution Control Administration for the purpose of conducting schools for citizens on problems of water quality and related land use.

If I may, I think since the State of Indiana is so well represented here today, you would be interested in knowing that I am going right from this hearing this afternoon to Indianapolis, and then to French Lick, where tomorrow we are holding a 1-day seminar in southern Indiana on environmental problems under funds provided by the league, the education fund, and Indiana University.

So this is the kind of thing to which I have had reference.

Mr. BRADEMAS. I hope you will, in your visitation, preach a modest sermon on the virtues of this legislation, Mrs. Clusen.

Mrs. CLUSEN. I will find a way.

Mr. BRADEMAS. One of the points that I wanted to put to you, Mrs. Clusen, and also to Dr. Stahr and Mr. Dustin in particular, and indeed any of you, is your general reaction to the wisdom, the value of our supporting through this legislation, environmental education at the community level outside the school system—through, for instance, community conferences in which, as I contemplated it, there would participate local governmental, State governmental officials, business leaders, industrial leaders, labor leaders, church leaders, civic leaders.

I ask if you think that is a good idea. Second, how would you conceive the conferences of this kind being operated in terms of two other issues, namely, the materials to be used for the teaching, the curriculums material, and, second, who would do the teaching?

You have all taken part in conferences of this kind. You would be more experienced than would representatives of other organizations, and I would be interested in your comments.

Mrs. Clusen?

Mrs. CLUSEN. First of all, let me say this is the part of the legislation which interests me most, really, and it is the major reason that the league decided to be here today to speak in behalf of it. There isn't now nearly enough money for this kind of counseling.

Over the years that we have been involved in community conferences, we have found it to be of value, and we have some materials relative to that which I think perhaps the committee might be interested in seeing, which we will put together and send along to you.

But, in essence, what we try to do is to select representation to our community conferences so that coming is not only an honor and a privilege, but we also almost make our participants sign in blood that they will go home and do followup.

We try to provide an overview of regional or basic problems and give some factual information about the situation. We present information on what machinery, what institutional machinery at the local, State, and Federal levels exist for handling problems in the regions. We talk about what the demands are—the competing demands for the use of the water or the air in this area.

Mr. BRADEMAS. Let me interrupt to say that that is not quite my question. Let me be very specific.

Mrs. CLUSEN. All right.

Mr. BRADEMAS. We want to put on a community conference on environmental education. Where do you get the people who know the subject to come and talk about and teach about it? You are bringing in the head of the AFL–CIO and the head of the Farm Bureau and other community leaders. What kinds of materials do you use? Where do you get people who can put on such a conference?

Mrs. CLUSEN. In the organizations, I think, represented here today primarily, and in hundreds of others, like the unions, which are now showing a considerable interest in this. I think there is leadership on a local and State level in a good many civic organizations which can do exactly this, in conjunction with local and State agency people, who certainly do know the situation in connection with the universities and colleges which exist in the area.

As far as materials are concerned, each one in a sense has developed their own thrust in this kind of thing.

Mr. BRADEMAS. Mr. Dustin?

Mr. DUSTIN. Yes. John, I understood your question there to be about the value of having public programs as opposed to the in-school operations.

Mr. BRADEMAS. As distinguished from.

Mr. DUSTIN. Yes. I think this would be a valuable adjunct, because I think it is important to get this to the broad spectrum of the population. The secondary schools don't hit page 1, section 2 of your metropolitan newspapers. So we have a dual role to do. We have the strategic response of getting the young people before their minds are made up, and the continuing job of penetrating into the adult fabric itself. You have to have public meetings involving public figures.

Mr. BRADEMAS. Dr. Buchheister and Mr. Morton, would you care to bring your chairs up and join Dr. Stahr?

I still am not getting an answer to my question. My original question is overly rhetorical, namely, nobody quarrels with the proposition that it would be a good idea to provide support to private, nonprofit organizations to help provide environmental courses through community conferences. I take it nobody disagrees with that.

Now, having said that, I am trying to get to the hard questions of where do you get first-class, scientifically valuable, objective, pedagogically sound teaching materials, because I am not sure I really can assume that people really know all that much about these matters.

Second, where do you get the personnel who are able to afford, who are able to provide such teaching for such courses?

My own bias would be to think that you just cannot find that kind of people wandering around in most communities in the United States, that they are rather scarce people.

Dr. Stahr, do you and your colleagues from your experience in the Audubon Society—I noted that you have put on summer ecology workshops to train teachers and you have developed curriculum materials. Perhaps in the light of your own experiences you and your associates may want to address yourselves to that question.

Dr. Stahr. May I let Dr. Buchheister take a shot at that?

Mr. Buchheister. Mr. Chairman, in the experience we have had for over 36 years in running ecology workshops, I may say to you that while it seems that it would be very difficult to get qualified personnel, we have found that we can get qualified personnel from the colleges and from the universities and from the museums and from private organizations who are exceedingly well qualified to teach teachers and other youth leaders in the field.

I would like to stress right away that in teaching in the field, in an ecology workshop such as we have had experience with, and successful experience, this is not teaching hard-core botany, biology, ornithology, and that kind of thing—but essentially it is teaching the relationship of man to his environment and the relationship of animals and plants to soil and water, and this type of thing. People go away with an understanding, and a sufficient understanding that enables them to say that when a pond is drained this can have a bad effect, or if a pond is heavily polluted with sewage and effluent of various kinds that this can have a chain of damage. This is the kind of thing one can do.

Now, as far as materials are concerned, there are a number of organizations that have now some very fine material. I think if one really made an attempt to assemble this material, we also would load you up with a great many very fine individual pamphlets and articles from magazines, and so on, that could be used in schools.

Mr. Brademas. I wonder, Mr. Clapper—you remarked upon the proliferation of such materials also, and you mentioned the environmental education study staff, which I guess has just been established in the Office of Education.

Do you know if, in that office, or in some other office perhaps outside the Government, there exists some kind of clearinghouse for the collection and dissemination of teaching materials in the environmental field, particularly for use in schools?

Mr. Clapper. Yes and no. I think there is a dire need for additional materials of the type that you are speaking about. But some efforts have been made in this direction.

There is an organization known as the Conservation Education Association, which has endeavored to pull together all of these teaching guides, teaching aids and teaching materials of this sort. There have been grants given by the Office of Education and on the State level by some of the State agencies which have sponsored educational projects which have been going into this type of thing, and then listed bibliographies of this type of material.

I recall a gentleman in Ohio who produced an outstanding bibliography of this type of material. I think, also, that there are some additional materials available through organizations such as the Izaak Walton League, which under a grant from the Federal Water Pollution Control Administration conducted a citizens program on how to go about developing the workshops and developing testimony on water-quality standards, and that sort of thing. A similar thing is being done in air pollution through the Conservation Foundation, and a grant from the National Air Pollution Control Administration.

Our organization is sponsoring a workshop in Oklahoma next month under a grant from the National Air Pollution Control Administration, where we are pulling in people from all the States for this type of activity.

I worked on the State level for 9 years, and we conducted teacher workshops similar to the type of thing you are speaking about. We had no difficulty at all in calling upon resource-agency people for the expertise you need to teach soil-erosion control, and forestry, and wildlife management and this sort of thing, to the teachers, which gives them an idea how they can go out and conduct workshops for the children.

I would also commend the National Audubon Society for their nature-center program, which I think answers some of these needs, too, where they have stimulated the cities to establish nature centers where educational institutions can bring children to the scene, this is outdoor-laboratory work.

Mr. Brademas. I think one of the fundamental things developed in our hearings so far, if I had heard the witnesses right, is that when they talk about environmental education, they have a concept of going beyond what we have thought of as nature education directed solely toward wildlife and air and water in order to get across the importance of appreciating a relationship of man as part of the environment to the rest of the environment and to encourage a greater sensitivity to the values that are involved in those relationships, so that I do not know, because I don't pretend to be an expert in this field—I do not know the extent to which the kinds of teaching materials that you have all been describing are in line, or are on all fours with what I take to be a rather broadened, wider definition of what we now mean when we use the adjective environmental.

Dr. Smith. I wanted to point out what Dr. Buchheister said and emphasize it briefly. I think it is the level we are discussing here that is very important.

I suffered through the whole economic-education program, which went through the public school system. The public school curriculum is one of the most resistant organisms you will ever find. It is too bad some of the organisms in our ecology don't have this resistance. It is hard to penetrate for any reason, good, bad, or whatever.

As I say, I had some experience with economic education, and there we had labor unions, banks, major businessmen, all the assumed establishment on our side. And it took 11 years to make the slightest dent in the public school curriculum in terms of economic education.

Therefore, I am simply saying that it isn't a question of whether we ought to do this in conjunction with other things. This is a priority item of getting these councils and meetings at the community level, because you have to establish an enormously effective political climate in order to get the kind of educational effort in effect within the public school system. Unless you do that, you do not get a reaction from the public school system in any of its curriculum. I think this is one of the major thrusts of this bill. I see it as that, anyway.

Mr. BRADEMAS. Yes?

Mr. DUSTIN. Aren't we in this effort really breaking some new ground in which we are not likely to know all of the answers at the outset? We are engaged here in a search, as much as anything else, perhaps. This isn't a discrete action like establishing a new park or a wilderness area. There are going to be some questions and some mistakes, most likely.

Mr. BRADEMAS. I think your analysis is right on target, and indeed that is one of the reasons why the bill as written provides for curriculum development. It does not assume that all the answers are known. And what has impressed me, in our hearings so far, is how even the experts and authorities and people who give their whole lives to this particular area come in and say that we don't know all the answers, including the scholars at the universities.

I want to be sure my colleagues have a chance at you. So let me yield to Mr. Landgrebe.

Mr. LANDGREBE. Thank you, Mr. Chairman.

I am particularly happy to see some of my former associates in Indiana here today, including Dr. Stahr and Mr. Dustin. I am glad it was possible for me to be here so I could extend to you gentlemen a sort of bipartisan welcome from this committee.

Certainly, anyone at any level of government today who is not interested in our surroundings or environment would be of a very weak mind, for sure. And I am interested in this bill. I do have a couple of questions. And to hurry along, I will get directly to them.

On page 3 of Mr. Clapper's report, he has reference here to the Office of Education's establishment of an environmental study staff. Is there any possibility that this staff will be able to carry out most of the goals of the bill that we are talking about here? Is this broad enough, and does it not perhaps have the authority to do this job without taking away from the enthusiasm for my chairman's bill?

Mr. CLAPPER. I would have one comment on this, Congressman. Up until about 6 months ago, Dr. Wilhelmina Hill who authored this particular leaflet for us, and who was on our advisory board for our children's magazine, was the only employee of the Office of Education who was a conservation or environmental specialist. And now the staff has been, we are told, expanded to include 14 people. These are four staff people, four interns, and the balance in secretarial-clerical help.

We think this is a fine start. We don't think it goes nearly far enough. And we would think that certainly if the program is expanded as envisioned by this bill, that additional personnel certainly would be necessary to ride herd on the grants and to give direction to the program.

This is why we recommended an Assistant Commissioner head up this particular activity.

Mr. **Landgrebe**. Another question of anyone who wishes to answer—and maybe no one wishes to answer this question.

Is it possible in this area of environmental problems—and perhaps we have left some of these things neglected for too long—but one of the items is thermal pollution. In this day and age of mechanical refrigeration, and so forth, it would seem that we have no problem solving it other than money. It is just a matter of providing the manpower and the money that it would take—and, of course, the laws and the enforcement of the laws.

Is it possible—and this is really not a fair question of you gentlemen—most of you are educators—is it possible that we might spend too much money on studies of education and really not have the resources to do the job?

Certainly, some of these things can be accomplished—disposal of acids and these things, which industry in my community is hard pressed to find a solution for. They drill holes down in the ground a mile deep, and they are pouring the acid down there.

It would seem that with studies there could be answers to specific problems. Are we talking about spending too much in a general way here and not having the dollars left to do the specific jobs that we need to do to solve the problems?

Dr. **Smith**. Congressman Landgrebe, it seems to me that this is a problem at any times as to how much you are going to put into research, how much in action programs, and how much in education. If you are talking about space travel, you don't have any problems. We have held six hearings on a little bill on the Apostle Islands National Lakeshore, and I think the total of it is $6 to $10 million. Somebody makes a mistake in the Armed Services Committee and says, "I am sorry, but we got the decimal point in the wrong place. It should be $3 billion instead of $3 million." And everybody says that is all right, and they go ahead with it.

It just depends where you want to put your money. It occurs to me that the environmental area has been starved so long that I am not at a point where I would say we have to proceed with undue caution. We have had 200 years of that. I think we need boldness here. We don't see it yet. We didn't see it in the last administration. We hear the comments in this administration, but we await the performance. I think the performance is going to come when the money comes.

You are asking me, is it possible to spend too much money on education for environment, and is it possible to spend too much on research? Yes, it is possible. I don't think it is very probable.

Mr. **Landgrebe**. Thank you.

That is all I have, Mr. Chairman.

Mr. **Dustin**. Congressman, I think it is probable that in the continued development of civilization we will continue with certain tradeoffs of value. I don't think there is much doubt about this.

But the question is, what is the nature and the quality of these tradeoffs? What is the actual cost to the environment for pursuing certain courses?

And I don't think we have ever really tried to learn what that is. We have vertical agencies, like the Corps of Engineers, which moves along on its own, and other agencies doing something else. But without a good overall view of all these causes and effects and of all the inputs and outputs and the quality and nature of the tradeoffs, I think we need to build into the society of tomorrow a greater awareness of what the impact over there is when you plug something in over here. And by creating an awareness threshold, this is the first step toward better decisions in the future than we have made in the past. No one has tried to gather all this in a bundle until the advent of this bill, at least so far as I know; this is perhaps one of the values of it, to try to create an overall generalized awareness in the public minds as to what it is going to cost us in terms of environment when you do this and that. Nobody really knows now.

Dr. Stahr. I might venture a hazardous analogy to the field of medicine. It is perfectly true that no one would propose stopping the treatment of disease or the development of improved surgical techniques. And when we have them, we ought to use them and spend what it costs to get the value from them.

But I think that over the long pull you get more from the dollar that is spent in preventive medicine, which includes educating people in simple things like sanitation.

So it really isn't an either-or matter. I think you have to work on the preventive front while you are working on the treatment front. And the preventive measures, coming back to this field, as preventive measures through education take hold, the need for corrective measures will diminish.

Mr. Landgrebe. Is there further comment?

Mr. Buchheister. I would like to add this. You mentioned thermal pollution and the research necessary to find a way in which thermal pollution effects can be lessened.

Well, if, with education of people who demand that there will be no thermal pollution, because we know enough about it to know that it is bad, and can be very bad in many instances, the industry itself is spending immense sums to find out how they can correct these things—I am sure that in time, with their own money, they are going to find it, like the automobile industry, in its own time, will find out how they can lessen air pollution from automobile exhausts.

But this money is going to come from the industry, and the consumer is going to pay for it, too. And that is not too bad. But what is not being paid for is the kind of thing your bill addresses itself to. This has to be done. Otherwise, we are not going to get it.

Mr. Landgrebe. I would like to venture just a brief comment, Mr. Chairman.

I have a very fine constituent who proposes we consider the possibility of by law limiting the size of motors in automobiles. The horsepower doesn't necessary have to be 300, 400, or 500, and it would be possible to develop automobiles that would go 24 miles on a gallon. And this would automatically reduce the pollution of automobile exhausts by 50 percent.

The other part of my comment is that we have discussed priorities. I gave you gentlemen a chance to impress me on this matter, and this is what you are here for, to impress the Members of Congress in a matter of priorities. And I have been impressed by your responses.

I would like to speak just a second on this matter of looking to the military, which we just alluded to in passing. It seems that every time we come up with a problem in America, we immediately say we can take some more money away from the military.

I have great sympathy with Mel Laird's statement that he thought the military budget had been reduced to the bone and that further reductions could endanger our national and international security. I am very cautious about that matter.

I believe that concludes my questions and my statement.

Thank you, Mr. Chairman. And thank you, gentlemen.

Mr. Brademas. Mr. Steiger?

Mr. Steiger. Thank you, Mr. Chairman.

I want to first of all pay a special tribute to Mrs. Clusen and to welcome her back before the committee. It is a delight to have you here.

She has been on of those who has done an excellent job in the league, and I am well aware of what the league has done for a long time in the whole area of water resources.

I have read all of the statements, and I must say I come away somewhat confused on at least one point. And that is what we do about an advisory committee.

Dr. Smith, you have said that you have grown old on advisory committees and therefore we ought to limit their roles.

Dr. Stahr, you say that you think the advisory committee ought not to be as cumbersome as it is proposed in the bill.

And, Mr. Clapper, you say we ought to strengthen the advisory committee.

I suppose I am asking for some guidance from you about which way you think we ought to go. Do we strengthen it, weaken it, get away from it, or put younger people on it? I suppose that is what I am asking.

Mr. Brademas. If my colleague would yield for just a moment, I don't think he was able to be here yesterday when Margaret Mead testified. But it was her suggestion, which may be relevant to this question, that not only did she want an advisory committee, but thought that there ought to be a junior counterpart for each advisory committee member, so that if there were 21, and normally six, she suggested, would show up, that the rest of them could have their views represented.

That might be a halfway house.

Dr. Stahr. I might comment first, Congressman, that those at this table did not get together ahead of time.

Mr. Steiger. Obviously.

Dr. Stahr. To try to present you a coordinated view. I think we could do that in a matter of a few days on this particular point of the advisory committee. In listening to the comments of the others, I don't think I heard any that I would strongly disagree with, and I heard a few I would strongly agree with.

I think it ought to be a strong committee. I don't think it ought to be encumbered with a lot of the administrative work, which was the only comment I made on it originally.

I liked Mr. Clapper's suggestion, I believe it was, that the committee have some authority—not final authority, but that the committee's advice become effective unless actively vetoed, so to speak, by the Secretary. That it not merely be filed and put on a shelf and ignored, which does happen sometimes, to reports of advisory committees.

Mr. STEIGER. Thank you.

Dr. SMITH. Congressman Steiger, the point I was trying to make is that if we do make it a strong advisory committee and a meaningful thing, all right. But if we are not going to do that, then let's not do it at all. This is what I meant when I said I had grown old in the usual pattern of advisory committees. Frankly, I don't think they ever amounted to much on the whole. Once in awhile you can come up with one that has made real and significant contributions. But most of the ones I have been on are not challenging, and we never made many contributions.

And we used to have a Secretary come in and tell us he had 215 advisory committees reporting to him. And you got the message that he would prefer 214.

I have the feeling that if we just put in another advisory committee, with all due respect to the bill before you, which we do support, this reads like a kind of patented, normal advisory committee approach. I don't mean administrative responsibility, but some real policy-oriented some real thrust and some muscle and some real responsibility—and I don't mean administrative responsibility, but some real policy-oriented responsibility, where they can make a meaningful contribution—I am for it.

I think that this section on the advisory committee, however, in order to do that in the present legislation would have to be rewritten. That is my judgment.

Mr. STEIGER. Do any of you disagree with that?

OK, I think that is a pretty good statement, as a matter of fact. I appreciate your clarification. I will not say "ambivalence," because I don't think that is appropriate or fair.

Would any of you object to the suggestion made last week, as I recall, to include students on the advisory committee?

Dr. STAHR. Indeed, I think it would be useful.

The only problem you would have is the age-old problem of turnover. They just don't stay students forever.

Mr. STEIGER. That might be superior to those that don't turn over at all. [Laughter.]

Dr. STAHR. I am inclined to agree. I think there ought to be a pretty tight time limit on the service of any of them at whatever age, including those who do try to be students forever.

Mrs. CLUSEN. Could I respond to that question?

Mr. STEIGER. I would be delighted to have you respond.

Mrs. CLUSEN. In my testimony for the league, I did not make reference to this particular part of the legislation. I think probably because in general the idea of judging an overall committee of some type—the general idea of this is certainly one that is palatable to us.

I would agree with the comments made by Dr. Smith that I think it should be refined, better defined, and perhaps we would even want to go so far as to indicate size and proportions of numbers and representation on it in order to achieve a balance.

Generally, the League of Women Voters tends to think that this kind of an outside group, which takes a look at governmental programs, is a good thing. And I think we would be glad to lend support to this idea. But I think that I would agree with these gentlemen on the panel that this section needs tightening up, and needs greater definition.

Mr. Steiger. Let me go into a couple of other points, if I may, Mr. Chairman.

One relates to the very obvious problem that exists today. We now have in Federal programs fairly wide latitude which enables title III of the Elementary and Secondary Education Act to fund 110 environmentally oriented projects, and the Defense Education Act to fund some projects in this area, and so on.

Thus, we are spending at the Federal level some thousands, or millions of dollars in environmental education. What is our problem? Why is what we are now doing not effective, if it is not effective? And what would you recommend besides an Assistant Commissioner of Education for this concept, which would help us do a job better than what we are now doing?

Dr. Stahr. Could I have Mr. Morton respond to that?

Mr. Morton. Congressman, I think that certainly the programs that have been established that you referred to are being well received. I think from our own experience in working with teachers, the problem is information of the teacher in the classroom—this is brought about primarily because they don't know enough about the out-of-doors. They are beginning to get ecological understanding, but they need to be taken out through their own environment so that they are at least one step ahead of their students. And many of the students today, as you well know, are very, very alert to these problems. And I think that if workshops can be established, workshop programs as part of a bill—and I know in this case it is—it would seem to me that a great deal of emphasis should be put on making the teachers at east to enable them to get out and work with students outside the classroom itself.

Mr. Steiger. Well, we do this now, don't we?

Mr. Morton. We do it, but it is amazing how long it takes for a person to go from the four walls of the classrooms to the outdoors. There is an awful lot of redtape involved in the school system to get out even around the block, or in a very short distance from the school for just a normal field trip, not necessarily dealing with the environment.

Somehow we have to give the teachers the strength so that they can actually go out and do this.

Mr. Steiger. The workshop envisioned in this legislation gives the teacher the strength he needs to do this?

Mr. Morton. It certainly does, based on our Audubon Society workshops.

Dr. Stahr. Let me add, Congressman, that, yes, we are doing this, but what we are doing is so little relative to need that it is not having much impact on the public. But what we have learned in doing it can have a use in the national program.

Mr. Clapper. In preparing for this hearing, I consulted a man I respect on the educational level to get his advice. And he thinks the greatest need right now is to teach the teachers. They simply are just not coming out of school equipped to teach environmental education or conservation or their interrelationship. They may have some type of natural history, but they don't make any effort to relate it to the outdoors—or why a bird may die, or something of this sort.

The State of Tennessee, for example, is spending a lot of money and a lot of time just on teacher workshops to teach the teachers and to tell them how they can teach conservation on their own school grounds, to show soil erosion on hillsides on their own school properties, or to show that moles have a part in the ecology right on their school grounds. And this is something we hope title III of this bill, will help stimulate.

Mr. DUSTIN. I have a letter here that I read a portion of a little bit ago from the Outdoor Education Consultant. I would like to read a couple of paragraphs. He says:

> If Indiana schools are to develop adequate environmental education programs, it is imperative that House Bill H.R. 14753 be passed. At present teaching materials, in-service training programs, pre-service training programs and adult education programs for environmental education are inadequate and will continue in such a state of affairs unless funds are allocated for improving curriculums in this vital area.
>
> If environmental education is to be taught effectively, teachers must be provided attractive film strips, films, teaching guides, experimental testing equipment, other teaching materials and equipment, and appropriate training for making the best use of such resources. Present financial limitations of Indiana school budgets severely restrict the likelihood of local or state monies being applied to these needs.
>
> H.R. 14753 would also remove the ambiguity in regard to the place of environmental education as an integral part of the school curriculum. My position in the Office of State Superintendent of Public Instruction is an illustration of this ambiguity. My position was established by the initiative and financial backing of several conservation organizations in the State of Indiana and has the wholehearted support of State Superintendent Richard D. Wells. The state has not made my position permanent. Hopefully a bill will be introduced in the 1971 General Assembly which will establish this position. In 1969, however, a similar bill was introduced but died in the House Education Committee. How can I effectively implement new programs in the state when my position is in jeopardy? H.R. 14753 would make it mandatory for this position to be permanently established in the Office of State Superintendent of Public Instruction before schools could make application for environmental education financial assistance. The position of Environmental Education Supervisor is essential to the coordination and direction of teacher training and curriculum development projects in this increasingly important area of public concern and this bill would firmly establish it. H. R. 14753 would also assist our office in securing participation of teachers for in-service training activities. As you know, intensive environmental education workshops are sponsored by this office. Teachers are provided methods and materials for improving classroom instruction. Teacher evaluations indicate the workshops are very worthwhile; however, the evaluations suggest that teachers should not have to pay for in-service training. Funds are needed to subsidize teachers for expenses incurred in attending in-service training programs.

Mr. STEIGER. Thank you all. You have been helpful.

In conclusion, let me ask one question. Do you agree, given the statement that you made in support of community, nongovernmental, citizen group involvement that the greatest need is training of teachers, that this is the first priority?

Mrs. CLUSEN. I don't really have any way of measuring that. But our interest in this legislation is based primarily on the strong feeling we have that more money is needed for community counseling by civic organizations and nongovernmental groups. And it would be hard for me to say that I think this is more needed than teaching the teacher.

I know that the chancellor and vice chancellor of the University of Wisconsin-Green Bay appeared before this committee a couple of weeks ago, pressing for funds for teaching the teacher, in essence. And I would be tempted to believe that what I hear from educators about this is true. But I can't make a value judgment about which is the most necessary.

I think I would like to make one brief point about community education in this, and I think this was at the root of the fact that Chairman Brademas and I were not communicating at the beginning of this dialog. It was because I have a strong belief that citizens don't have to become scientists or technicians or ecologists in order to make rational decisions about the environment, that they need to know enough to help them understand what is going on, what the choices are for them. But I would hate to see us think that we need such expert, highly technical scientific teachers as far as community conferences are concerned that it would inundate the public and make it feel even more helpless than it does now about decisions to be made on the environmental front.

Mr. **Steiger**. Thank you very much. Thank you all for coming. You are a good group of witnesses.

Mr. **Brademas**. I have just a couple of other quick questions.

I might say, Mr. Clapper, that following your observation that you believe 1.2 percent of the Federal budget is dedicated to environmental resources, I checked with my office, because I recalled having taken a poll of my constituents a couple of weeks ago and asking them to list those several areas where they thought the Federal Government should spend more, spend less, or the same. But one area, the area with respect to which they said we should spend more was pollution control. And 80 percent of them said we should spend more there. And I believe the area where they thought we should reduce the most was military. I think about 69 percent of them said, "Cut back there."

In respect to the advisory committee, about which Mr. Steiger was questioning you—and I think in a most helpful way—I would just observe that there are good advisory committees and bad advisory committees, depending on the people on them.

Also, it seems to depend on whether or not they are really to some extent independent of control by the particular agency to which they are counselors.

So I think members of our committee have been most impressed by the value of the report of the advisory committee to title I of the Elementary and Secondary Education Act. They have been valuable reports, largely because they are not owned by the Department of Health, Education, and Welfare, but because they are independent-minded types who say exactly what they think. Therefore, you give their views more credibility than you otherwise would.

So I just wanted to reassure Dr. Smith that it is my own hope that we do have an advisory committee but that it be one that really thinks for itself, in order, I also think, to have some genuine public-policy impact on shaping the kind of programs that would be funded under the bill.

I would also express the hope that you and your colleagues, Dr. Stahr, could make available to our subcommittee, if you are in a position to do so, any judgment you have on the effectiveness of your teacher ecology workshops, because, again, I took you to be saying in response to Mr. Steiger's questions that you feel you have learned something about teacher training in this field, but you don't have the resources to carry out this effort for all of the schoolteachers in the country. But we might learn something about teacher training from you.

(The information requested follows:)

National Audubon Society,
New York, N.Y., April 28, 1970.

Hon. John Brademas,
Chairman, Select Subcommittee on Education,
Washington, D.C.

Dear Mr. Brademas: I am happy to respond on Dr. Elvis Stahr's behalf to the request for further information on Audubon Camps and the cost of Nature Centers which you made in the course of the environmental education hearings before your Select Subcommittee on Education on April 9.

Our Educational Service Department informs me that a total of 18,817 campers have attended our Audubon Camps since the opening of the first one in Maine in 1936. Of this number, our records show that 7,978 or some 42.4% of the participants have been teachers. Based on the assumption that each teacher will have taught an average of 35 students a year, we estimate that in all they have influenced 280,000 students over the years. As a sample of the teacher's reaction to their experience at our Audubon Camps, I am enclosing statements of six camp graduates testifying to the value of the program and to its influence on their teaching.

With regard to your question as to the costs which would be involved in a federally supported program of community nature center development, since capital outlay monies generally can be found locally, we feel that the real need is for funds to aid with planning and with initial operating costs for the first three years. After the value to a community of a nature center has been demonstrated through several years of operation, it has been our experience that local funds become available to cover further operating costs.

Although costs vary from project to project, it is our opinion that a planning grant of $6,000 and an initial operating grant of $30,000 ($10,000 a year for three years) for each project would be sufficient. Thus with an estimated planning and initial operating costs of $36,000 for each qualifying project, a federal program for the development of fifty new nature centers a year would require an annual budget of only $1,800,000.

Planning funds

50 nature centers at $6,000 each, project planning	$300,000
50 new nature centers with $30,000 operating funds each ($10,00 a year for 3 years in each case)	1,500,000
Annual total	1,800,000

From our long experience with the value of nature centers we feel that even such a modest program would yield tremendously valuable results in terms of national environmental awareness.

I hope that this information will prove helpful to you and that you will call upon us again if you should require any additional material.

Sincerely,

Chaplin B. Barnes,
Administrative Assistant to the President.

Bob Bleiweiss, 6th grade teacher, P.S. 70, Bronx GO (General Organization), classroom teacher: "Everything I learned in the Greenwich Workshop has been of help. I reach 400 to 500 children weekly, partly through seminars in which they can ask conservationists answers to problems in the environment. The children have followed up with a poster campaign in which schools, neighborhood stores and the PTA have cooperated."

Christine Popowicz, 2nd grade teacher, P.S. 148, Queens: "For the first time in my life I felt really close to nature. Since then I've been stressing the interrelationships between man and nature . . . the total picture, not just man. I was able to make the alligator crisis clear to my class."

Freda Hoffman, P.S. 79, Queens, Elementary school science teacher: "In my work I often automatically think of the Audubon Society. That week (in Greenwich) was more than just exciting; now I know what's "out there"; I feel secure with nature. The biggest help was learning how to get it across to my classes. The Audubon materials are a wonderful help. I am part of an in-service course on the use of community resources and participate in teacher training."

Margaret O'Brien, P.S. 111, Queens, School science teacher: "When I graduated from college I felt competent to teach natural science. My week at Greenwich made me realize I was dragging in all the textbooks instead of inspiring anybody. The naturalists made me aware of so many things I was missing . . . I felt stimulated, enriched. I saw things with new eyes. This is something I can pass on to my classes."

Sam Bels, District Science Coordinator, District Science, Manhattan: "At present I am concentrating on a district-wide implementation of class room learnings; Ward's Island (New York City) is an excellent laboratory for field work in ecology. We reach about 3500 children a year through 200 to 300 teachers; the interrelationships between man and his environment are stressed. I had a science background before attending the Greenwich Workshop but that week started me in this direction."

Mildred Becker, Naturalist, High Rock Nature Conservation Center, Staten Island: "I had always been deeply interested in nature but didn't see how to consolidate my interests in a methodical form that could be used professionally. My week in Greenwich was the start of a new career, a new way of life. Everything came into focus and I learned how to convey ideas to the children . . . to make them aware."

Mrs. Joan Rosner, District Science Coordinator, Project Director of District 23, Natural Science Workshop: "One direct result of my first summer at the Greenwich Workshop as *A Discovery Walk in Natural Science*, made with the cooperation of the Office of Science Education and the American Museum of Natural History. This film-strip is used by schools all over the city. In Queens, our active Arbor Day programs have helped develop the local Botanical Gardens arboretum; to date 122 trees have been planted by children. Our Children's Natural Science Workshop is an interpretive center to which children from 12 schools come for workshops and field trips, much as they do in Greenwich. Our staff, all of them Audubon Workshop graduates, reach over 2000 children and 75 teachers. I initiated and coordinate 6-day summer workshops for the teachers and supervisors of two districts; the program was inspired by the one in Greenwich, and is patterned after it, but differs in taking the whole family."

Mr. BRADEMAS. I wonder if I could ask you just two quick questions, Dr. Stahr. You may want to comment of this.

How do you sensitize the urban child to the environmental situation? Here, I suppose my question suggests the more traditional outdoors-nature-conservation orientation.

Dr. STAHR. Well, if you wait until you can do that, you may have waited much too long, although it certainly would be desirable to get them out into a different environment when you can. But it is a colossal undertaking. The way you really sensitize them is to try to do it in the environment where they are. At least that is the additional thing that scarcely is being done.

There is a little of the other in some cities, where they do take the children out of the city or to a place in the city which is more or less natural, which we have referred to as "nature centers," and give them some experience and some teaching there.

But the very thing I mentioned that we have been working on with those New York City teachers, most of whom teach in the ghettos, and have firsthand experience with the problem, this sort of thing we are going to have to have a lot more of in this country if we are going to have any sort of appreciation of the environment by a very large percentage of the next generation.

Mr. Brademas. I wanted to congratulate you, Dr. Stahr, and the Audubon Society on the materials collected here as part of the ecology study program. Just glancing at them, they appear to be very well done, indeed.

My final question is this. Dr. Mead yesterday suggested the value of establishing a program for allowing so-called mini grants with simplified grant forms to make it possible for applications from a community or neighborhood levels to be submitted for support for some of our studies projects.

Does anybody want to give me a reaction to that suggestion?

Dr. Stahr. It is a fascinating idea. One of the greatest problems with most grant programs, whether by government agencies or great foundations, has been that they are just not geared up to make anything but big grants. And there are so many very useful small things that never get done because there isn't a little bit of money available.

Mr. Brademas. Mr. Clapper?

Mr. Clapper. I would make one brief comment about this. You might inquire from the Conservation Foundation, another one of our groups, about the experience it has had with so-called seed-money grants that they have made under, I think, at least partially with support from the Ford Foundation. They have made several grants in the neighborhood of $2,000 to different communities to explore a particular problem with respect to the effect of a highway upon a natural area, or something of this sort. And I think experience from that organization might be useful.

Mr. Dustin. Mr. Chairman, I would like to suggest that there is a place for the private sector to participate in this. And I think I like the idea of mini grants. But I wonder if I might suggest an offer on a matching basis of some kind.

In Indiana we have a small endowment corporation with assets of less than $4,000, and yet we would like to participate and provide some funds for the holding of these workshops for educational purposes. While I think we need the main thrust of this bill, we would like also to preserve the opportunity for private services to be rendered and private funds to be used, instead of at every point turning for a grant large and small.

Mr. Brademas. I want to express my appreciation and that of the members of the subcommittee to all of you for your testimony today. It has been enormously helpful to us, as I think you can judge from our questions.

I believe that Dr. Stahr has a film that he would like to show, and I would be glad to do that, and have those of you here in the hearing room today remain. It is a rather brief film.

Dr. Stahr. I haven't seen the film "Islands of Green" but I have faith that it is worth seeing because my colleagues assure me of it.

Mr. Brademas. Our hearings this morning are adjourned, and we will take a look at the film.

(Whereupon at 12:10 p.m. the subcommittee recessed, to reconvene at 9:30 a.m. on Friday, April 10, 1970.)

ENVIRONMENTAL QUALITY EDUCATION ACT

FRIDAY, APRIL 10, 1970

House of Representatives,
Select Subcommittee on Education of the
Committee on Education and Labor,
Washington, D.C.

The subcommittee met at 9:30 a.m., pursuant to recess, in room 2261, Rayburn House Office Building, Hon. John Brademas (chairman of the subcommittee) presiding.

Present: Representatives Brademas, Steiger, and Meeds.

Staff members present: Jack G. Duncan, counsel, Ronald L. Katz, assistant staff director; Arlene Horowitz, staff assistant; Toni Immerman, clerk; Maureen Orth, consultant, Marty LaVor, minority legislative coordinator.

Mr. **Brademas**. The subcommittee will come to order for further consideration of H.R. 14753, the Environmenal Quality Education Act and related bills.

Congressman Galifianakis was to have been our first witness but had to leave unexpectedly. We will ask unanimous consent to insert his statement at this point in the record.

(The statement referred to follows:)

Statement of Hon. Nick Galifianakis, a Representative in Congress From the State of North Carolina, Fourth District of North Carolina

Mr. Chairman, I am most appreciate of the opportunity to add my voice to those advocating improved and intensified environmental education without delay.

I know you have heard extensive testimony emphasizing the great need for more and better programs in environmental education at all levels of the school system. In reviewing the provisions of the Environmental Quality Education Act, I concur with its recognition of the problems we now have:

1. a lack of accurate knowledge of the factors which control our environment, and of the ways in which they must be safeguarded to prevent deterioration, and permanent damage;
2. a lack of accurate knowledge of the technology and methods with which an over-exploited and contaminated environment can be brought back to full use and productivity;
3. a lack of understanding of the magnitude of the task to maintain a viable and healthy environment from generation to generation.

I think we are agreed that accurate, concise knowledge of all aspects of environmental management, preservation and utilization must be made available to our children—who have *already* expressed a keen interest in the subject—and that this teaching must begin as soon as possible. I believe that the priorities to be followed in acquiring the necessary tools for this purpose are these:

1. The training of teachers who will have the knowledge, understanding, and appreciation of the many facets comprising man's environment, and the enthusiasm to import it to their students. A new wave of youngsters begins school every year, and each year new enthusiasm must be summoned to kindle their interest in environmental quality. The present way of encouraging nature studies and some aspects of conservation practiced by all too many of our school systems falls far short of preparing our children for the task of preserving the world!

2. Preparation of appropriate curricula and the accompanying textbooks.

3. Resource materials made available in properly structured and administered local libraries, to be used not only by students and their teachers but by the adult population as well. Such materials will hopefully form the core of informative and instructional material for adult education programs in the community.

I am pleased to be able to say today that a serious effort in environmental education has begun to be made in my own State, North Carolina. A bill introduced by State Representative Norwood E. Bryan, Jr. and passed by the legislature last year led to the establishment, by the 1969 General Assembly, of a 42-member Task Force on Environmental and Natural Resources. The Task Force, chaired by Mr. Bryan, was appointed by the State Superintendent of Public Instruction in keeping with the bill's specification that studies conducted by the Task Force should be under the aegis of the State Board of Education. The study undertaken by the Task Force is designed to investigate how environment is taught in the schools today. The type of instruction it aims to achieve is spelled out in the preamble of Mr. Bryan's bill which reads as follows:

> Environmental education is defined as education dealing with the relationship of man and his bio-physical environment, and is aimed at producing a citizenry which is aware of environmental interrelationships and processes, understands how to solve environmental problems that arise, and is motivated to work toward their solution.

As a consequence of its investigations, the Task Force is planning a state public school curriculum on the environment, perhaps the first in the nation.

Within the State, my own district is fortunate in housing the Research Triangle Park where several institutions of higher education are located as well as several divisions of the National Air Pollution Control Administration, including the Office of Manpower Development and the National Institute of Environmental Health Sciences. The numerous environmental activities undertaken by these institutions as well as their joint undertakings such as the recent Triangle Universities Consoritum on Air Pollution, provide orientation and technical and planning help for primary and secondary education as well. Specific studies on environmental resources within the State are particularly helpful such as studies conducted in the University of North Carolina's Water Resources Research Institute, and programs conducted in the School of Public Health, the Carolina Population Center and the Center for Acoustical Studies.

I believe that this is the type of coordination—with available resources in institutions of higher education and private organizations in the area—which Superintendents of other school systems throughout the country would do well to emulate. Obviously, the preparation of special courses of study, the writing and printing of textbooks and other instructional materials will take time. We cannot wait for a perfect program. We do have available resources which can be utilized in the interim to improve existing instructional methods, so that teachers can begin immediately to acquire the necessary knowledge and provide their students with more meaningful instruction.

Using the outdoors as a tool to environmental understanding has long been the practice in most schools having an environmental studies program. I agree that this is a very necessary component to an understanding of environmental quality. However, most of us today live in a largely man-made environment—in urban areas surrounded by man-made structures, man-made utilities, man-made facilities. Our inability to cope with life in such surroundings and the resulting deterioration of many of the values which have brought mankind to its present sophistication are the cause for our abused and polluted surroundings. I would therefore urge any teacher interested in environmental quality education to acquaint his students not only with "the great outdoors", but with existing man-made mistakes as well—the slums, the traffic jams, the polluted industrial areas, rivers which have become sewers, and open spaces which have become garbage dumps.

I am also concerned lest environmental education be approached only from one aspect—that emphasis would be placed only on pollution, or as another example only on the proliferation of pesticides. I feel that it is most important to stress that environmental quality is tied up with all facets that make up human life—natural resources and technology, housing, transportation, urban and rural problems, civics and human psychology. When we provide financial support for any proposed programs in environmental education, we should take these factors which encompass as many of these aspects as possible.

Arnold Toynbee said that the essence of the story of mankind and the survival of civilizations is to be found in the cycle of challenge and response. We are meeting the challenge to a deteriorating environment today by our desire to respond. We are willing to enlist our resources and our abilities in the task to reverse the abuse and overuse of the resources which our planet possesses. The essence of our pursuit is to make the air once again invisible and odorless, the water pure and colorless, the earth rich and fertile. In this country we hold it the duty of government to secure our right to the pursuit of happiness. Proposed legislation such as the bill before you reminds us of Thomas Jefferson's statement that the care of human life and happiness—and not their destruction—is the first and only legitimate object of good government. Now in the early stages of this environmental decade, Congress must respond to the great challenge before us. We must make our response as effective and meaningful as this country's ingenuity and state of technology and knowledge will permit.

Mr. BRADEMAS. Our second witness is Miss Martha T. Henderson, director of education, the Conservation Foundation.

We are pleased to have you with us this morning.

STATEMENT OF MARTHA HENDERSON, DIRECTOR OF EDUCATION, THE CONSERVATION FOUNDATION

Miss HENDERSON. Mr. Chairman, thank you for the opportunity to testify at these hearings. Although I am employed as senior associate in education at the Conservation Foundation, the following statement is my own and does not necessarily reflect the views of the foundation.

I believe that we must have legislation which supports environmental education, but the issues involved are complex. I agree with the testimony which you heard earlier this week by James L. Aldrich of the Education Development Center, and I also concur with the published statement of Edward A. Ames of the Ford Foundation which you have in hand.

It is clear to most of us that we face a crisis of the environment. Many forms of pollution and increasing population undermines the fabric of life, but we cannot solve our problems merely by cleaning up the mess. We must develop a new social ethic if we are to build a world which represents man's accord with nature and his wise use of technology. To change people's values, their cultural set, is not easy, but it must be the task of education to try to do so.

I believe with Mr. Aldrich that—

> The need is for a concentrated effort to develop the materials, teacher training, and style of classroom operation which provide the basis for exploring the vast web of relationships of man with nature, of man with man, of the partnerships which must exist if we are to reestablish a life worth living.

A broad definition—broader than the one I think given—of environmental education is a necessity for this bill.

U.S. society has recently tended to offer a declining range of options for the ways in which we should live. The emphasis has been on material progress in setting national and to some extent personal goals. We must provide a far greater range of options for future living which allow for a time of greater economic equilibrium. This may involve a different standard of living, new forms of social groupings, smaller families, and a shifting of values to nonmaterial gratifications, all of which hit us at very fundamental levels of assumptions about how life actually is or how it should be. But with population pressures, it may become necessary to develop nonmaterial values strongly, since there may be less opportunity for economic benefits for all.

At the moment, education is primarily transmitting the values of the status quo. While we must maintain the role of schools in the transmission of our cultural and historical traditions, we must change education in order to have school and university experiences help to suit us for a continuously changing world. We cannot know all the outlines of this world, but we must use education to begin to help us shape new ways of life.

Obviously such a concept involves children and college students in active knowledge of the real world. Too often at present our schools are insulated from the life of the community around them. I think we have some sample programs which use the city for learning and we need places for students to learn in other ways.

The changes we are posing are major and they involve using education about man and his environment as a vehicle for school and university reform. This particular bill cannot meet all educational needs, but it should contribute to basic changes in our value system.

Many question whether U.S. society can be moved toward such profound shifts. There is always a great deal of inertia in a social group with any degree of stability, and a lot of people in this country still draw considerable satisfaction from the way things are.

But one can perceive signs of a degree of openness to change in the United States, and it is upon these signs and our belief in them that we must build. We see young people and some not so young experimenting with freer social groupings. We observe those who appear to be troubled by the obvious problems of our world, but unable to figure out options which do not unduly threaten them. Their difficulty arises, in part, because the true shape of various alternatives is not made easily available for consideration, nor are they able to find ways to experiment with new options.

But as a nation we are usually hopeful and want to believe in a bright future somewhere, somehow. We care especially for the future of the young in whom hope for all of us is inevitably vested. If we can give people new ways of life to work toward which seem potentially less problematic and full of despair about our environment and more fulfilling than those they have at present, then we may be able to achieve a situation in which continuing change is acceptable.

To search out how to live in harmony with new ways of life will require the resources of many fields of science, social and behavioral science and planning. It should also include the insights of the arts and humanities.

What is to come is frequently expressed metaphorically by artists: they press their feelings into the future and give them shape. It is through the arts and humanities that we can first give voice to our aspirations and dreams and even to our religious beliefs and ethics. If we can write poems about our hoped for world, inner and outer; if we can act out theater games or project new architectural forms for our homes and communities, then we can begin to set forth options for our futures. Artists can lend drama and esthetic form to our choices, as Professor Kepes of Massachusetts Institute of Technology has indicated.

Nor are the arts to be considered only a frill. They can be a tremendous source of inspired learning experience. If people are not excited about what they do, they will not learn. We have only to watch the young singing with Pete Seeger or experimenting with a film about their neighborhood to see that they are capable of being "turned on" by them.

Once involved, children can experience the serious, in-depth education we should want for them in all areas of learning. They can explore alternative ways of expressing themselves symbolically and can learn from history and from foreign cultures how others have handled particular problems.

They can, as Kenneth Koch describes in his recent book on teaching poetry at elementary school, begin to comprehend the uses of comparison and of contrast, of metaphor and analogy. They can think or express themselves and they can be active and play. It is not through such varied explorations that we begin to take pleasure in learning about ideas and expressing them in all their complexities and depths? Is it not in this manner that children learn how to think clearly? Do they now?

In short, I believe the arts have many uses. They can help to counter the present situation where too often citizens passively accept environmental misuse and ugliness, feeling powerless to make judgments on esthetic matters concerning the shape of their lives. Feeling they can do nothing, they sink back into apathy which is potentially disastrous to any encounter with our world.

Education in the arts and humanities will give people the ability to express their feelings and their esthetic needs by direct contribution to decisions about their surroundings. They will know better how to evaluate possible alternatives for the style of their world.

A degree of competence in writing, film, architecture and other areas will help us to communicate with one another about our problems on verbal and nonverbal levels. This ability to communicate can be used to reach wide audiences through TV and other media which can do much to get our environmental messages across.

We lack sufficient educational materials in these fields. The Architectural Forum notes a number of programs in architecture and planning, and the Office of Education, the two National Endowments and private foundations have funded other intriguing work. There are also programs where children actually study in museums or where poets are resident in schools, and artists now work in our national parks. I believe many of these efforts deserve support, but essentially I think we should try to back arts and humanities curriculums only as part of interdisciplinary programs which are aimed at changing basic values.

The arts and humanities alone, of course, do not suffice to build a better world. I have emphasized them because they are so often neglected and can be particularly potent vehicles for change. But the poet should know how to engage in effective political action about air pollution, as well as to write of his troubles with breathing. The architect needs training in form, space and color, but also in engineering and economics. There is a basic role in all environmental deliberations for scientific ecology, and I agree with Mr. Aldrich's plea for a greater input of behavioral science. In other words, we are talking about a multidisciplinary approach.

This approach is now exceedingly popular and leads directly to a breaking down of traditional disciplinary barriers in academia. Two excellent statements of this problem are given by Steinhart, with whose report on universities you are familiar and by Dr. F. Kenneth Hare in the January 23 issue of *Science*. I would underline the need they express for student participation in working out changes in academic structures.

And I do think this bill ought to perhaps fund some student programs.

Perhaps interdisciplinary studies should come naturally to us. After all, the small child naturally responds to his world through many senses and activities and can integrate the message he receives. A Washington-based environmental collaborative is studying this area, and some few programs emphasize an open classroom with less disciplinary emphases.

The bill should help schools with this type of organization. But in our society usually we quickly wean children away from their early integrated approach and guide them into specialization. In time we become fearful of once again being obliged to cope with broad ranges of reality.

To ease this fear, and to make institutional changes, we need to explore methods by which multidisciplinary approaches to environmental problems can be made more manageable and thus less threatening. At the simplest level, a man who is specialized in one subject can make himself sufficiently familiar with others to work with them.

A second and much-vaunted scheme concerns the interdisciplinary team, which seems particularly suited for fieldwork. While not always entirely smooth running, and subject to the usual human failings and the threat of superficiality, teams can certainly be effective. I strongly endorse funding multidisciplinary university programs.

These types of practical endeavors do not remove the compelling need to find overreaching principles which may give us intellectual order. The development of such concepts will depend in part on defining our environmental problems at levels of sufficient depth. If we allow ourselves merely to get caught up in an endless array of pollution problems, we shall easily become scattered.

On the other hand, if we can press ourselves to more fundamental global issues such as new sources and uses of energy and new ways of grouping humans to use it, we may begin to arrive at ideas large enough to provide a measure of intellectual security and excitement.

Another source of order in complexity is systems analysis. Clearly the basis of an ecological approach lies in the reality that we all interrelate with one another and with all the living and man-made environment. We must acquaint (or possibly more accurately reacquaint) children with the idea of systems. Much more work is needed on how the young perceive the systematic relationships of their world, indeed how any of us do. Individuals and groups publishing in environment and behavior are exploring this field and deserve assistance.

But once we have identified components of a system and have seen how they relate to one another, then we are faced with understanding their dynamic movement. In problems as complex as our urban environment, about which Professor Forrester of the Massachusetts Institute of Technology writes, the human mind unaided may have almost insurmountable difficulty in comprehending how the system operates and outcomes to be expected over time. A computer can be an invaluable tool.

Nor should the use of computers be feared as destructive of our humanity or of the arts. In fact, artists and scientists are now collaborating on the use of computers to build better environments. The goal for computer use should be what Erich Jantsch refers to as sociotechnological engineering. We do not yet fully understand how to employ computers to solve or assist with massive problems.

But we should open the door to students, to let them carry our explorations forward by introducing most of them to the use of this tool. We need some work on how people do receive systems. Once we understand what the components of the system are and how it fits together, we need to realize how it works dynamically and there the computer is an invaluable tool.

While I think some people feel that the computer will dehumanize our society, I think it can be used to make us more human.

I think possibly a demonstration program especially of school use of these computers in this field might be a worthwhile effort.

The necessary cooperation on complex ecological-social systems implies exploration of cooperative systems of social organization. Most of those now writing about new institutional forms point to groupings with much more participation by the varied members of all levels and less authoritarianism.

Not everyone has the same voice in an organization, but all work together toward a common goal and mutually learn along the route. In such a situation students can have a genuine place in effecting change, while teachers must forswear their omnipotence and become guiding colearners in the process.

I believe that education badly needs the insights of policy planners in order to gain more clarity into the interplay between values and institutions. I would note policy planners are also very much interested in the dissemination of change throughout a society.

In the time remaining there are just a few questions I should like to raise on the matter of teacher education, which is obviously a crucial area for action. If we take it that teachers usually treat children in the manner in which they have themselves been taught, then we must consider how to make preservice and inservice education responsive to the need for a multi-disciplinary, problem-solving approach. We shall have to ask whether teachers understand fully how to relate the inner needs of children to the requirements of their surroundings. We must inquire whether teachers have a sense that they can play a role in bringing about changes in behavioral styles.

There are no simple answers to these issues. But there are pieces of the answer all around which cry out for coordination. We have various curricular materials in many fields, not yet appropriately focused together on the environment. We have experimental programs at colleges and schools which appear to be succeeding.

We can observe not only new ways of working with teachers, but new avenues for recruiting teaching assistance. Business, government, museums, courts, and university faculty and students of many persuasions now work in or with schools. They provide both knowledge and an example of the life style of their callings.

We need an advisory council or a clearinghouse, perhaps a number of them, to select and communicate these programs. The proposed advisory council should include those who understand new trends in education in many fields and a fair size group of those under 30, including student leaders of groups like Ecology Action. It should also represent many professional and citizen action groups since ultimately we must educate the general public about the changes in our environmental values and what they mean for education. I also emphasize the need for the participation of policy planners.

During Mr. Aldrich's testimony, the chairman inquired about international education. Since, like Mr. Aldrich, I have connections with the International Union for the Conservation of Nature and Natural Resources (IUCN), let me add some footnotes on this subject.

First, I believe that since ecological problems know no boundaries, inevitably we must eventually educate people to view the environment as a global proposition. Margaret Mead has spoken to you eloquently about this subject. I hope there is money given for planning time in this program. I had a good deal to do with some of the work of ESEA.

I think if there had been more money allowed for planning and more chance to develop operation before we went into action out in the field, it might have helped to make things a little easier and go better.

I am also with the International Union for Conservation of Nature and Natural Resources. The work of the Conservation Foundation on the Ecological Aspects of International Development and of David Burleson and others in population education is relevant. There is an area where we should train those in international aid programs about ecology. The way to do this is to get a lot more about ecology into our international studies program, which are at the moment very much oriented toward social studies.

Second, if we are considering exploring new life styles, we should by film or travel try to present the modes of life of many cultures in varied environments, simple and complex. They can be used for comparison, as sources of ideas which might be pertinent even in our different setting, and to give us a sense of our ecological position relative to the rest of the world, and they can give us a sense of our place in the world.

There are some interesting programs there. We have provocative programs in anthropology mainly at college level, and there are also the Education Development Center's "Man: A Course of Study" and the Boston Children's Museum "Match Box" on Japanese life as examples.

Third, there are a number of programs going on abroad which deserve consideration. I don't think any of them are as etxensive in scope as this bill. Those in the developing countries obviously have other emphases and less emphasis on the individual because of their strong national priorities. Those from Europe or Japan reflect a strong disciplinary bias, usually in biology or outdoor education. But England, in particular, has developed some of the most extensive educational reforms at primary level yet known. Their influence is already considerable in the United States and is relevant to nondisciplinary classroom organization.

In order to keep in touch with developments, I should suggest that the appropriate U.S. body arrange liaison with the IUCN Education Commission in Morges, Switzerland, since the Union has much information in this area and will soon be expanding. Mr. Aldrich and I are a possible additional source of assistance through our connection with this IUCN Commission's North American Committee. Ties should also be maintained with the various United Nations agencies, both for data and in order to arrange participation in a number of upcoming major environmental congresses.

Thank you for your attention.

Mr. BRADEMAS. Thank you very much, Miss Henderson, for a most comprehensive statement.

You said that you felt that a broader definition of environmental education was needed than that contained in the bill. Would you elaborate on that?

Miss HENDERSON. I think the bill tends to look as if it was going to be one more disciplinary approach to ecology, instead of being an overall broad approach to man's relationship with nature. It could easily become just one more thing.

Mr. BRADEMAS. Certainly it is, as you may have judged from having heard some of the testimony so far, not my own intention as the sponsor of the bill to encourage moving in that narrow direction.

Second, you spoke of the role of the arts and the humanities. But I wonder if you could be more specific in explaining how you see their relationship to environmental education?

Miss HENDERSON. I think if you are going to project people into new ideas about the world, this is one way people do it. They do tend to feel out where they want to go, through expressing themselves in the arts. I think the children especially, if we can get their imaginations stirred up this way, it is a good thing to do.

Another problem in education in general is that people are bored and if you can reach them at the level of their feelings, it is an excellent way to get them to realize that things are going on. There are obviously specific things where they learn to shape their environment and express themselves about it and communicate about it.

Mr. BRADEMAS. You said on page 4 of your statement that a Washington-based environmental collaborative is studying—I take it from your sentence there—in the area of working with children in the very early grades. Could expand on what you meant?

Miss HENDERSON. I think they are looking at environmental education, but particularly how people learn about space and time, and vision perceptions of the environment not what their emphasis will be.

Mr. BRADEMAS. I am not familiar with the program.

Miss HENDERSON. It is a new program and experimental. It is just getting off the ground. It involves a collaboration with people both in schools, and in architecture and other disciplines that are relevant.

Mr. BRADEMAS. What about the question of curricular materials? From your knowledge of this area, are there teaching materials available that are not used for lack of knowledge about their availability or is it necessary for us to develop more and better teaching materials in this field?

Miss HENDERSON. I think both. There is nothing we have now that fills the bill completely by a long shot. But I do think with respect to the second thing you say, that there are some things around that could give you things to be useful. For example, there is a high school geography curriculum program which has some units which are specifically environmental in their concepts.

Mr. Brademas. It would be your thought that one of the responsibilities of the proposed advisory council would be to serve as a clearinghouse to receive such teaching materials and in turn, help encourage their dissemination?

Miss Henderson. Right. I don't know that the advisory council can take on this job, because I think it is an enormous one. But some group is very desperately needed to do this. I think most of us in this field are being swamped by the requests and don't know what to do with them all.

Mr. Brademas. How do you see meeting the problem of the teachers, especially for the elementary and secondary schools, to be able to teach environmental education?

Miss Henderson. I think we have to reach the present inservice institution. In the second place, we should look at experimental inservice programs. There are all kinds of explorations of new ways of handling teachers, the inspiration team here in the Cardoza area is one. There are a number of others, such as the parkway program in Philadelphia. I think we have to keep pressing on how we can reach teachers and change them. It is a terribly difficult area.

Mr. Brademas. I heard yesterday about the Audubon Society summer college teacher training workshops. Is that the kind of thing that might enable us to go after some of the teachers who are now in the system?

Miss Henderson. I think so. I know some are to be held in the population area, some to be held in a number of other disciplinary areas. OE is planning a few already. I think the difficulty is too often these get fractionated into the disciplinary lines. It would be useful to have them broadened out to consider all the ways in which environment is handled.

Mr. Brademas. Are you familiar with the programs in environmental education now funded under title III of ESEA?

Miss Henderson. Some of them, yes. Not too many, frankly.

Mr. Brademas. It has not been all that easy for us to find out just what is going on in that respect.

Miss Henderson. I think they tend to emphasize outdoor education, the ones that are labeled "environmental" at least do.

Mr. Brademas. Actually it was that kind of a general observation about those programs that I was seeking, the extent to which they really are on all fours with the kind of environmental education that we have in mind in this bill. I take it from what you say those programs, presently funded under ESEA, title III, are more narrowly defined then.

Miss Henderson. I think they tend to be; yes.

Mr. Brademas. Do you know what is going on in terms of State support of environmental education in the United States?

Miss Henderson. I think there is an increasing movement in that direction. I am not an expert in this. I think Dr. Hill has compiled quite a lot on this already. California, Pennsylvania, and other States have laws. Again you have the problem of what they mean by this, but at least they are moving in the direction of pushing this field.

Mr. **Brademas.** You talked about the value of the school use of computers. Did you have in mind the kind of use of simulated variables that we discussed in the hearings earlier this week or have you in mind some other application of computers?

Miss **Henderson.** I think variables in this can be very useful. I am not expert in this. I know Dr. James Coleman up in Johns Hopkins is working on some high school games using the computer in the political field. There is a group here in Washington with a city game. They take a computer set up around the schools. There are others and they ought to be made more widely available.

Mr. **Brademas.** I take it that you support, then, the idea of providing environmental education through the elementary and secondary schools.

Miss **Henderson.** Right.

Mr. **Brademas.** Would you give us your feeling about another purpose of the bill; namely, to encourage such education through community conferences and adult education programs?

Miss **Henderson.** I am not an expert in this field at all, but I think it is a vital necessity because, after all, essentially the decisions about education are going to be made by the citizenry. I know that our foundation has done what seems to me some very interesting programs about the Air Quality Act, in which they get people with reasonable expertise on a certain subject to go out and spark local groups to coordinate themselves around an issue. For example, in this case they got the TB association and a whole gamut of people, and got them organized locally, so that they provided people who were educated to testify and to appear at hearings and knew what they needed to. In this case, they were effective at hearings. In another case, they could be rallied to vote.

Mr. **Brademas.** Do I take it you would then support Margaret Mead's idea of minigrants for small groups, grants that would require very minimal effort to make the application?

Miss **Henderson.** Right. I would. And I would think student groups might be very useful for this work, too.

Mr. **Brademas.** What about the question of cooperation between schools and universities in a given community?

We have heard rather depressing reports about the unwillingness of various university faculties to cooperate with one another in a multidisciplinary way. Are we going to be able in elementary and secondary schools to turn, then, to the universities located in those areas for effective guidance and leadership?

Miss **Henderson.** I would hope so and I would personally hope that you would gradually get some faculty and a number of students not merely in education, but in relevant fields like planning or law or other things actually teaching in schools and allow teachers to have greater access to the university in special areas. The primary schools lack disciplinary boundaries. University faculty might learn how to collaborate across disciplines by working in the schools.

I think you have got to break down the barriers between the school, community, and university if we are going to handle this problem.

Mr. **Brademas.** You said you thought we ought to have some planning time. Would that mean that you wouldn't really want to put much program money out other than perhaps project demonstration money beyond the first year or what, until after the first year?

Miss Henderson. I think so. Perhaps there are some on-going programs to be funded immediately. If you are going to develop new programs, it seems to me very necessary to have the first year or some months at least to develop what it is you want—the operational definitions of programs, the kind of staff here in the Office of Education that you want to run them, and so on.

Mr. Brademas. I am not clear on what the International Union for the Conservation of Nature and Natural Resources is.

Miss Henderson. It is the group to which Mr. Aldrich referred.

Mr. Brademas. I still wasn't clear after I asked the question of him.

Miss Henderson. It is a group that has been running since 1948 that started, I think, with the idea more of protection of nature and then moved to natural resources, and is now moving more to the social sciences and realm of the human problems of the environment.

It has six commissions. It operates through headquarters, but also through a large number of regional groupings. Governments belong to it and private organizations. This is one of the uses. It is between both worlds. About 400 scientists have volunteered time to it. It has just received major new funding and new leadership and will assume an increasingly important role. (An explanatory document is attached.)

(The following program was submitted for the record.)

PROGRAMME FOR 1970–72

SUMMARY

IUCN was founded in 1948 as a response to the need for an international approach to conservation problems. Its status as a non-governmental organization enables it to deal with conservation matters from an independent standpoint.

For IUCN to meet the increasing world conservation challenges and to maintain its position in the forefront of world conservation and as one of the highest scientific authorities on environmental conservation, a significantly extended and strengthened program was approved at its 10th General Assembly held in New Delhi, 24 Nov.–1 Dec., 1969.

The present program involving the work of the Commissions, the intelligence center of its headquarters, the Red Data Books, UN World List of National Parks and Equivalent Reserves, regional and topical conferences and symposia, screening and evaluation of projects for WWF will be continued.

Additional major areas of new and expanded activities include:

(1) Expansion of the work of the Commissions.

(2) More active participation with technical assistance organizations, including acceptance of contracts for specific tasks, and promotion of conservation as a basic component in development programs.

(3) Increased capability for use of consultants and advisers.

(4) Improved library and information facilities.

(5) Transfer of Executive Officers of Commissions to headquarters to provide increased support for Commission activities and better coordination.

(6) Formation of ad hoc Project Groups to handle particular conservation problems.

(7) Expansion of cooperation with WWF including originating projects for consideration by WWF.

The Commission structure has given IUCN access to a large proportion of the world's experts on various aspects of conservation, However, it needs an expanded central professional staff to guide and service these Commissions and to deal with the expanded program outlined. Proposals have been agreed for the employment of such additional personnel and for a reorganization of the Secretariat and responsibilities and relationships of the various components of the organization to strengthen the effectiveness of the whole structure and to clarify the lines of decision and responsibility.

1. INTRODUCTION

Conservation is still an imprecise term but its meaning is becoming broader, expanding to embrace all areas of concern men have for the world in which they live.

Conservation can be defined as "management", including surveys, research, legislation, administration, preservation, utilization, and implies education and training, of the resources of the environment—air, water, soil, minerals and living species including man—so as to achieve the highest sustainable quality of human life.

2. BACKGROUND AND PURPOSE

IUCN is a Union of 29 nations and 225 non-political organisations in 59 countries, formed to initiate or promote scientifically-based action that will ensure perpetuation of the living world, man's natural environment, and the natural resources on which all living things depend. It is also concerned with the quality of life—with the physical, educational, social and aesthetic values which add richness, meaning and satisfaction to human experience.

As the Union has grown it has modified its program and its name to reflect the changing nature of problems; this is shown by the shift in emphasis from protection of nature to conservation of natural resources and the whole environment. But the basic goals established in its statutes remain the same. These are historic goals, voiced at Fontainebleau in 1948, but they have a new urgency today as IUCN seeks dynamic and original ways to find solutions for the growing problems of the biosphere.

During the last 20 years, IUCN has been influential in making public opinion aware of the problems of the environment and it is to a large extent due to its efforts that these are receiving so much attention from international agencies today. There is still a great need for an organisation such as IUCN to provide a continuous review and assessment of environmental problems and to act in cooperation with other organisations concerned with conservation, including international ones, such as the UNDP, UNESCO, FAO and ICBP, and regional ones, such as the Council of Europe, the Organisation of American States and the Organisation for African Unity.

The objects of the Union are stated in Article I of its Statutes. To meet present conditions, these purposes may be restated as follows:

1. To provide a continuing review and assessment of world environmental problems.
2. To formulate and promulgate statements of policy on topics of importance for the conservation of nature and natural resources based on the best scientific evidence.
3. To promote research and new techniques relating to the conservation of nature and natural resources.
4. Providing advice to Governments and organizations concerning the conservation of nature and natural resources.
5. To recommend and promote international and national policies of conservation (including legislation) and to assist in their execution by providing advice and mounting cooperative programs with other international agencies.

Priorities should be determined by the urgency of the problems and the capacity of IUCN to make a significant contribution to them.

The most urgent problems affecting the natural environment appear to IUCN to be as follows:

(1) The growth of world human population.
(2) Environmental pollution.
(3) The urgent necessity to plan the use and management of land, water, and their associated resources in such a way that they provide for the best sustained social and economic return.
(4) In planning the use and management of land, to give particular attention to sufficient provision for natural areas and the habitats of species.

3. PROGRAM

The present program of IUCN which will be continued, includes the operations intelligence center of its headquarters, maintenance of the Red Data Books on threatened species, maintenance and improvement of the UN World List of National Parks and Equivalent Reserves, planning and holding both regional and topical conferences and symposia, and screening and evaluation of the projects referred to it by the International World Wildlife Fund.

If the IUCN is to meet the growing challenge of world conservation and to maintain its position in the forefront of world conservation and as one of the highest scientific authorities on environmental conservation, a significantly expanded and strengthened program is required. The proposals for the commissions for new and expanded programs are outlined in Para. 3.4.; and some of the means proposed to make the Union more effective are outlined below. The detailed program for the next three years will be prepared by the Secretary-General and submitted to the Executive Board, taking these proposals into account and with particular attention to action on the priorities listed above, recognizing that (1) and (2) are already the concern of other international bodies.

In the next three years, the Executive Board, in close consultation with the Secretary-General, will evaluate the effectiveness of the organization and structure of the Union to carry out its function and meet its priorities. It will report and make recommendations on any necessary changes to the next General Assembly.

3.1. *Relations with inter-governmental agencies*

There is already a rising tide of conservation interest on the part of governments, and of international agencies and technical assistance organisations such as UNDP, WHO, WMO, World Bank, FAO, UNESCO and regional development banks. To meet this growing demand most effectively, IUCN will participate more actively with these organizations as a contractual partner in such activities.

A good indication of the need for IUCN to expand such a role is provided by the Union's continuing association with the Man and Biosphere (MAB) Program, currently being established through UNESCO efforts. This program will provide a framework for more future conservation activity and its development to date has shown that IUCN has the special qualifications to make an important contribution.

The Union will promote conservation as a basic component in development programs, particularly those sponsored by UNDP, the World Bank, regional development banks and other regional institutions. IUCN will do its utmost to encourage all countries which benefit from technical assistance to formulate requests so as to include conservation in new projects or modifications or extension of existing ones. This applies particularly to large-scale projects involving land-use planning.

IUCN will encourage and assist developing countries to establish projects connected with conservation for submission to technical assistance agencies.

It should provide advice on conservation problems, the execution of which involves projects such as furnishing short-term consultants, help in recruitment of advisors, defining educational policy, and giving advice and assistance on fellowships, curricula, and other educational activities.

IUCN will be prepared to carry out under contract certain aspects of the program of international agencies (including some aspects of the execution of the above-mentioned projects), particularly convening of meetings and seminars, preparing of publications, and undertaking of various training activities.

By achieving these objectives, a mutually beneficial association will be established between IUCN and inter-governmental organizations where the scientific, professional, and the administrative advantages of each partner will be used to maximum capacity to promote the success of conservation programs.

3.2. Consultants and advisors

In relation to the above proposal and for other tasks, IUCN will require rapid access to consultants and advisors who are available to take up the assignments involved. Accordingly IUCN will establish a register of such consultants and advisors for this work or for other specialized activities.

3.3. Information centre

An important function of IUCN is to review and assess information on conservation problems and to provide advice and disseminate information on conservation. IUCN already has a large amount of information and a library at its Headquarters; it is also in direct contact with conservationists, scientists and administrators all over the world.

To perform this function more effectively, the following steps are proposed:

(1) To expand the library and to develop its capability in the specilized field of ecology and conservation. Such a library should form an association with other appropriate libraries in the vicinity.

(2) To expand the facilities for data collection, retrieval and documentation at the headquarters and to develop close links with other data centres through the world which deal with conservation of nature and natural resources.

3.4. Commissions

A proposed change in the Secretarial structure aims to bring Executive Officers for the Commissions to the IUCN Headquarters. It will provide increased support for the operations of the Commissions, lead to better communication, and a more integrated approach. The outline proposals for the work of the Commissions for the next three years are as follows.

3.4.1. Ecology Commission

(1) The Commission will maintain two standing Committees: on the Ecological Effects of Chemical Controls and on Species' Introductions. It proposes in addition to establish temporary or 'exploratory' committees on Marine Conservation and on Arctic-Subarctic Problems. The two new Committees will keep in close touch with existing organisations in their respective fields, with a view to filling gaps in the conservation effort, and, in the second case, ensuring effective follow-up of the Conference on Productivity and Conservation in Circumpolar Lands north of the treeline (Edmonton, October 1969). A more permanent status will in due course be recommended for these committees, if justified by their achievements. It is also proposed to set up additional temporary committees to deal with ecological aspects of specific conservation problems, such as those of montane habitats, as soon as this becomes practicable.

(2) The Commission and its Committees will be responsible for advising and acting as a channel for advice to the IUCN on all matters having an ecological content referred to it by the Secretariat and also for bringing to the notice of the Secretariat and of the other Commissions, in particular the Education and Survival Service Commissions, the ecological implications of policies and activities. For the purpose of information and consultation of the Commission's expert members and contacts, newsletters with supporting memoranda will be circulated not less than four times a year; more particularly at least one annual meeting of the Commission will be organized, together if possible with periodic joint meeting of Commission representatives with those of other Commissions.

(3) The Commission will continue its responsibilities for maintaining and developing relations with the IBP, the Ecological committees and ICSU and the MAB program, with special reference to participation in and, where appropriate, taking over in agreed stages of part of all of the CT type-habitat and undisturbed island surveys; and, secondly, with reference to undertaking such contributions to MAB Projects as may be requested of IUCN and fall within the Commission's scope.

(4) The Commission will organize one or more Technical Meetings in the period on subjects to be decided in consultation with its members and approved by the Executive Board. These may well include a meeting organized in connection with the setting up of a Marine Conservation Committee, designed to identify the aspects of marine resources utilisation which have hitherto received insufficient or only incidental attention. The Commission will also support and, in suitable cases, co-sponsor other meetings within its field of interest and arrange for IUCN representation at such meetings, for example the SCIBP General Assembly in 1970, which will discuss the Ecological Basis for Environmental Management.

(5) The Commission will collaborate with the International Commission on Naional Parks in the preparation of the Third Edition of the UN List of National Parks and Equivalent Reserves, with special reference to incorporating in the List the results of IBP CT Surveys and the processing of the data. The Commission will also continue its support and make such contributions as are within its means and competence to the MAR, TELMA, and AQUA Projects.

(6) The Commission will plan and make recommendations to the Executive Board concerning the content and organization of the 12th Technical Meeting of IUCN to be held in conjunction with the next General Assembly.

3.4.2. Commission on education

An essential feature of this program is a shift in emphasis from education about nature conservation towards the much wider concept of environmental education.

MAIN PROPOSALS FOR THE PERIOD 1970–1972

(1) The Commission will develop further its regional structure as an important means for stimulating environmental education on a world-wide scale. New regional committees will be established and developed in Southern Europe, India and Central Africa.

(2) The Commission and Committees will hold several conferences and meetings devoted to environmental education, especially taking into consideration the educational needs caused by the most dangerous impacts of modern civilization on natural environment, such as pollution and other forms of deterioration of environment. It will also play an active role in conferences and meetings convened by other international bodies.

(3) The proceedings from the conferences and meetings will be published. The Commission's Newsletter will also be issued quarterly to persons within and outside the IUCN. It is also hoped to begin a new series of method publications on priority aspects of environmental education with special emphasis on the need of developing countries.

(4) There is an urgent need for developing projects. The team of the Chairman's laboratory will prepare a multi-lingual dictionary of conservation terms. In cooperation of other appropriate teams, the work on surveys on primary and secondary as well as higher teaching and training will continue including the establishment of an advisory service which would call on a range of experts. The regional committee will be encouraged in carrying out their own special regional projects.

(5) The Commission will continue its efforts in integrating the activities of several interested bodies concerned with conservation education and, in particular, will pursue the implementation of the recommendation No. 13 from the Biosphere Conference. It will participate in further preparations of the "Man and Biosphere" Program of UNESCO and develop a closer contact with UNESCO, especially on the contract-basis. Cooperation with the Council of Europe and other international bodies (such as EOE) will be intensified, especially by the regional committees.

(6) Cooperation with the International Youth Federation for Environmental Studies and Conservation is being reviewed and steps will be taken to strengthen the cooperation. Possibilities should be sought to appoint an IUCN youth-officer (as assistant to the Education Executive Officer) in the headquarters in Morges. A small working group on out-of-school education and activities has been established to explore these arrangements on behalf of the Commission.

(7) Members of the Commission and Committees and the staff will at request undertake direct operations (such as teaching, lecturing, conducting courses, and advising on education programmes) with special attention to the needs of developing countries.

3.4.3. *Commission on Landscape Planning*

(1) Production of more informative reports on the different aspects of landscape planning, as for instance landscape planning in regional planning, forestry, highway development, reclamations, consolidation schemes and other land use programs.

(2) Cooperation with Universities and procuring sponsoring sources from universities, organizations and foundations for studies on the specific subjects mentioned under Point 1.

(3) Close cooperation with the other Commissions of IUCN in the promotion of these studies.

(4) Closer relationship with FAO and UNESCO for the integration of Landscape Planning in public works sponsored by these organizations.

(5) Setting up regional groups to promote a closer cooperation between conservationists and land use planners in the different parts of the world.

(6) Contributions to international conferences, Council of Europe, IRA, IFLA, UNO, etc. to high-light the conservation aspect of Landscape Planning.

(7) The production of informative publications of various kinds to further the knowledge of the practical application of landscape planning principles.

(8) A study of the possibility to set up a Red Data Book on the world's most beautiful landscapes which are threatened through development.

3.4.4. Commission on Legislation

The Commission will continue to promote adequate legal measures for conservation of Man's environment and for this purpose will:

In general—Continue to inform on specific questions with regard to existing legislation in the field of environmental conservation as well as to advise on proposed conservation legislative and statutory measures, or propose such measures itself, through appropriate IUCN channels.

In particular in the near future—Promote better protection of species and especially will enquire further into the necessity of having an international agreement on marine turtles, in cooperation with the SSC;

Promote adequate legal control of the illegal traffic in wildlife, and for this purpose will finalize the work undertaken with regard to the IUCN convention on the Import, Export and Transit of Certain Species of Animals and Plants;

Promote the protection of valuable ecosystems and to this end will study the possibility of using elsewhere the "easement" contracts used in the USA and will offer its collaboration to scientific bodies concerned with the conservation of the arctic and inhabited islands;

Study US Legislation at the Federal level on environment and possibly at the State level with the help of a US lawyer working in the office in Bonn and initiate a similar undertaking for Latin America;

Peruse the East European Legislation with the help of a Czech lawyer who has agreed to come to Bonn for three months;

Complete a pilot computer project by processing 6,000 legal acts and establishing for the purpose a relevant thesaurus.

To these ends—The Commission will continue to collect legislative and statutory measures pertaining to the environment on a world wide scale and will widen the working basis, at present strictly limited to legislative and statutory material, in order to cover as far as possible case decisions and authors' comments.

In order to carry out this program the Commission considers that the permanent office, presently staffed by one French-speaking qualified lawyer, will have to be enlarged to include one English-speaking lawyer as well, together with a full-time secretary and a part-time documentation officer, plus adequate equipment. This does not include staff required to carry out the computer program, for which extra funds will be made available.

To strengthen the work of the Union, consideration is being given to enlarging this Commission to include environmental policy as well as the original responsibilities for legislation and administration.

3.4.5. International Commission on National Parks

(1) Maintain and if possible intensify by reinforcing the staff at the headquarters in Brussels the routine work of the Commission: supporting action for endangered National Parks, stimulating the establishment of new National Parks, answering to information requests, seeking of funds for specific programmes, etc.

(2) Make a systematical use, in order to stimulate the establishment of new parks of the status improvement of existing reserves, of the French and English versions of the "U.N. List of National Parks and Equivalent Reserves".

(3) Obtain that ECOSOC votes a resolution recognizing this List as a formal U.N. document which will considerably increase its value as a means of persuasion and will definitively enhance the selection standards that ICNP has been trying to obtain recognition for during the five past years.

(4) Improve, with the help of a biologist now attached to the Commission Headquarters in Brussels, the collecting on punched cards of any data concerning reserves considered for inscription on the U.N. List, parks and reserves deserving to be added to it and sanctuaries which are being created or whose present statute is being reinforced.

(5) With IBP/CT, prepare a new edition of the List, especially by completing ecological descriptions, or by putting the data on punched cards.

(6) Systematically enlarge the bibliographical documentation of ICNP Headquarters in Brussels.

(7) Initiate also with the help of the above mentioned biologist, the publication of a periodical bulletin providing topical information on national parks and equivalent reserves. This bulletin should, if possible, be circulated to all National Parks Directors of all countries, especially to those of the protected areas named on the U.N. List.

(8) Keep an up-to-date list of experts which would be sent on survey, management or advisory missions, in which the authorities wish to improve their National Parks and Equivalent Reserves System.

(9) Finally, if the offer made to the U.S. National Parks Service is accepted, an important activity of ICNP between 1970 and 1972 should concern the international aspects of the preparation of the Second World Conference on National Parks which will be held in connection with the Centennial Anniversary of Yellowstone National Park.

3.4.6. Survival Service Commission

(1) To continue to service existing Red Data Book volumes on Mammalia, Aves and Pisces. To publish new volumes on Amphibia and Reptilia, Mollusca, Angiospermae and Gymnospermae. To initiate the preparation of volumes on Insecta, Pteridophyta and Bryophyta.

(2) To promote closer liaison between the SSC and the Union's Ecology and International National Parks Commissions, and other international organisations such as FAO and IBP (CT), with a view to stimulating more effective management of the world's ecosystems and thereby reducing the recruitment of taxa to the Red Data Book.

(3) To promote awareness of threatened species problems among Governments of countries in which these species occur, and among biological science departments of the world's universities. To encourage greater national responsibility on the part of the Governments and greater interest on the part of the universities for effective management and study, respectively, of Red Data Book species, particularly those which have received little or no attention.

(4) To continue to concentrate the SSC's effort on those species whose effective conservation demands international cooperation, such as the marine species of mammals and reptiles, and very rare species that occur in a number of different countries, such as the Sumatran rhinoceros.

(5) To continue to promote the conservation of rare species through the cooperation and activities of zoological and botanical gardens, and the regulation of capture and acquisition of threatened forms, for which the SSC has already assumed considerable responsibility.

(6) To be ready to act in emergency situations that threaten the continued existence of any animal or plant species.

3.5 Project groups

IUCN is initiating a Project Group structure in which groups are formed to handle a particular conservation problem. Membership includes representatives from the concerned Commissions, co-operating agencies, and the World Wildlife Fund. These groups will function only long enough to deal with their specific problems. In general, these projects will be supported from outside funding sources, with Secretariat personnel and services assigned by the Secretary-General when appropriate.

Two examples can be cited within the framework of the Survival Service Commission. Plans are being made to form a Kouprey Project Group. It would be desirable to have the group jointly sponsored by FAO and UNESCO, with Cambodian, French and U.S. scientists participating in efforts to try and save this unique gene bank from extinction. A second example relates to the extensive work in the Udjung Kulon Nature Reserve of Indonesia, the habitat of the gravely endangered Javan rhinoceros. This has been a co-operation venture with the World Wildlife Fund, the Fauna Preservation Society, the Basle University Patronage Committee, and the National Biological Institute at Bogor in Indonesia, supporting research on the ecology of that rhinoceros and working towards its conservation.

3.6. Scientific and Technical Advice to World Wildlife Fund

IUCN is the acknowledged scientific and technical agency for the World Wildlife Fund, and an important aspect of the Union's work has been the screening and evaluating proposals submitted to the Fund for financial support. This work will be continued, and in addition the Union will undertake to originate project proposals of high urgency and importance for the consideration of WWF, as well as provide data as a scientific basis for WWF campaigns.

4. PROPOSED STRUCTURE AND ORGANIZATION

The Organization of IUCN is determined by Statutes and By-laws. The original version of the Statutes, voted at Fontainebleau, 5 October 1948, was revised at the Sixth and Seventh General Assemblies in 1958 and 1960, and further amendments were adopted by the Tenth General Assembly in 1969. The existing Statutes are in many ways broad and flexible, and the necessary changes in structure and organization can be made within them. Responsibilities and relationships are being strengthened, and lines of decision making clarified.

To co-ordinate the work outlined, IUCN proposes to reorganize its Secretariat structure. It will establish new posts of Director-General (the post of Director-General will be occupied by the Secretary-General), Deputy Director-General, Senior Staff Ecologist, and Associate Staff Scientist. The Secretariat will also be strengthened by the addition of further members of the full-time professional staff to cope with the work of specific Commissions. The envisaged new structure will probably be along the lines charted in Appendix A.

Priorities for action by IUCN will be established in accordance with the following procedures:

(a) Proposals will be first received or initiated by the Secretariat;

(b) Where appropriate proposals may be referred to the Chairmen of the relevant Commissions or selected specialists;

(c) The Secretary-General/Director-General will prepare a program in suggested order of priority for consideration by the Executive Board.

5. BUDGET

In the years 1963–1965, IUCN's income and expenditure averaged Sw. Fr. 399,000; the corresponding figure for 1966–1968 was Sw. Fr. 867,000. The proposals for 1970–1972 average Sw. Fr. 2,150,000. It is confidently expected that the proposed programme is sufficiently practical and indeed essential to world conservation to attract the necessary funds. No funds from any source will be accepted by the IUCN if their acceptance involves control of IUCN policies, objectives or personnel.

IUCN stands ready to assist the United Nations or its member countries in any way in which it can.

APPENDIX A

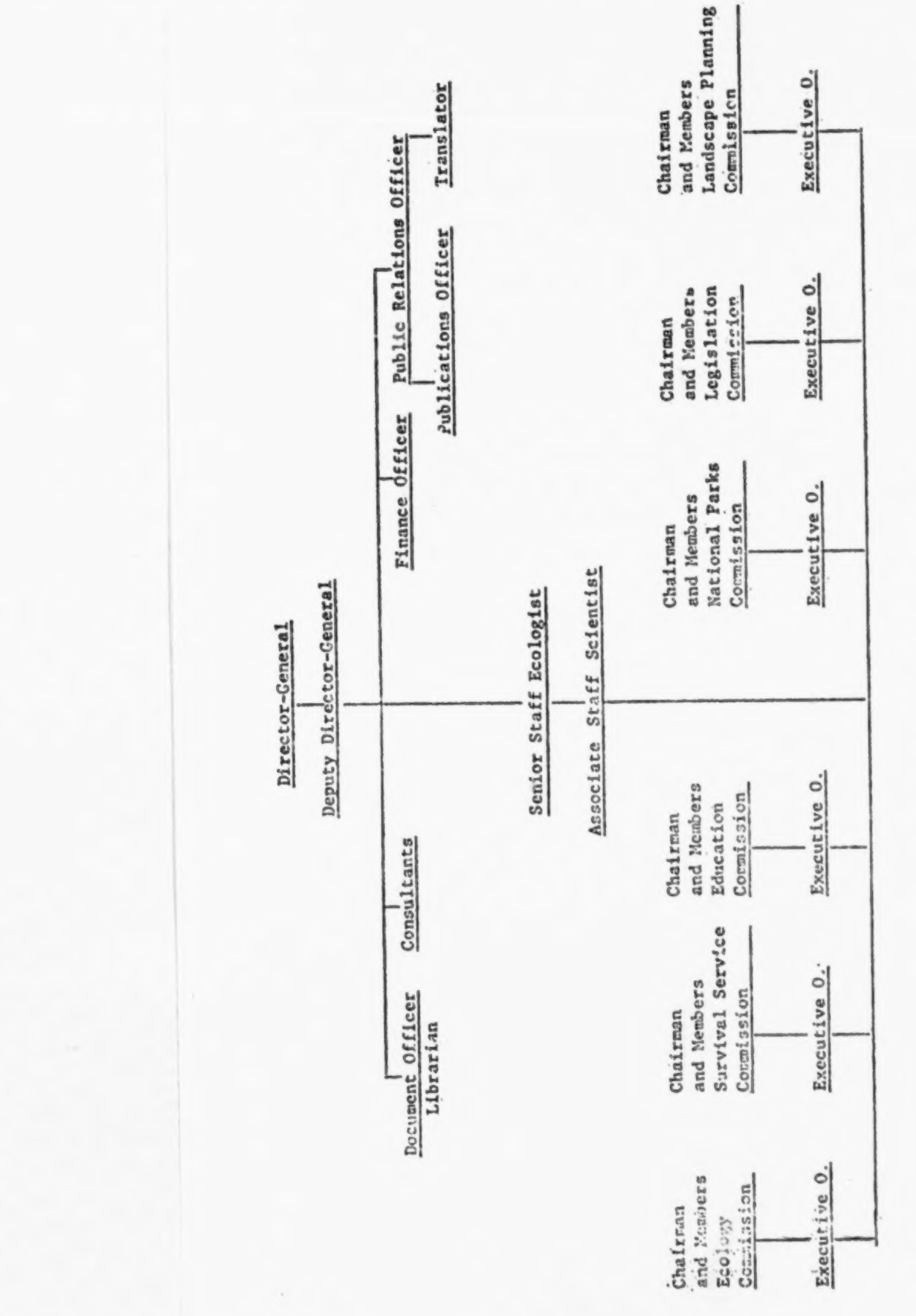
Director-General
Deputy Director-General
Document Officer
Librarian
Consultants
Finance Officer
Public Relations Officer
Publications Officer
Translator
Senior Staff Ecologist
Associate Staff Scientist
Chairman and Members Ecology Commission
Executive O.
Chairman and Members Survival Service Commission
Executive O.
Chairman and Members Education Commission
Executive O.
Chairman and Members National Parks Commission
Executive O.
Chairman and Members Legislation Commission
Executive O.
Chairman and Members Landscape Planning Commission
Executive O.

CHART OF PROPOSED ORGANISATION

IUCN—Founded Fontainbleu 1948—Officers and Board Members Following New Delhi General Assembly, December 1, 1969

President: Mr. Harold J. Coolidge (U.S.A.).

Vice Presidents: Dr. F. Fraser Darling (U.K.); Shri Zàfar Futehally (India); Prof. Ian McT. Cowan (Canada); Dr. Chr. Jouanin (France); and Prof. Dr. M. F. Mörzer Bruyns (Netherlands).

Chairmen of Commissions: Survival Service, Mr. P. M. Scott (U.K.); Education, Dr. L. K. Shaposhnikov (U.S.S.R.); Ecology, Dr. J. B. Cragg (Canada); National Parks, Prof. J.-P. Harroy (Belgium); Legislation, Mr. W Burhenne (Germany); and Landscape Planning, Mr. R. J. Benthem (Netherlands).

Secretary-General: Mr. E. J. H. Berwick (U.K.), until March 30, 1970; Dr. Gerardo Budowski (Venezuela), April 1, 1970 to September 1972.

Executive Board: Mr. B. N. Bogdanov (U.S.S.R.), 1966–1972; Dr. Robert Carrick (Australia), 1966–1972; Ing. Agr. I. N. Costantino (Argentina), 1966–1972; Prof. Ian McT. Cowan (Canada), 1969–1975; Mr. B. Dioum (Senegal), 1970–1976; Dr. W. A. L. Fuller (Canada), 1964–1970; Shri Z. Futehally (India), 1967–1973; Prof. U. Hafsten (Norway), 1970–1976; Dr. Chr. Jouanin (France), 1970–1976; Prof. Dr. V. A. Kovda (U.S.S.R.), 1967–1973; Prof. H. E. Luther (Finland), 1964–1970; Prof. R. Matthey (Switzerland), 1969–1975.

Doc. Dr. A. Medwecka-Kornas (Poland), 1967–1973; Prof. Th. Monod (France), 1964–1970; Prof. Dr. M. F. Mörzer Bruyins (Netherlands), 1969–1975; Dr. P. N. Neto (Brazil), 1970–1976; Dr. M. E. D. Poor (U.K.), 1969–1975; Dr. L. M. Talbot (U.S.A.), 1969–1975; Mr. R. E. Train (U.S.A.), 1966–1972; Dr. J. A. Valverde Gomez (Spain), 1970–1976; and Dr. D. P. S. Wasawo (Kenya), 1964–1970. . . .

Mr. Brademas. My last question might be because of your experience in the international field to ask what countries you think Mr. Meeds and I ought to go visit to see what they are doing in the field of environmental education from which we in this country might learn.

Miss Henderson. I would certainly think in England. Of course, you could understand them so well, but they have not only some innovations in general, but they have also developed an extensive series of nature and trails and outdoor centers. They have developed programs in the new towns where the children record changes in the natural surroundings as the town grows.

The nature conservancy there, I think could give you a number of leads onto this very quickly. I think some of the Scandinavian countries, Holland, and Czechoslovakia have some interesting programs. East Europeans have a lot of cooperation with youth groups—an important facet of this problem—Japan has interesting teacher training centers.

Mr. Brademas. Dr. Stahr of the Audubon Society, yesterday urged us to amend this bill for authorization for the establishment of nature centers. Do you have any comment on that suggestion?

Miss Henderson. I think that is one thing. I am in favor of anything like that. But I would like to see some city centers, too. In the environment field they would be very useful; they could be like the neighborhood museums with a more environmental focus.

Mr. Brademas. Your testimony has been most helpful to me. Thank you.

Mr. Meeds?

Mr. Meeds. Thank you, Mr. Chairman.

I would like to ask the same question that Mr. Brademas asked about the Conservation Foundation, Miss Henderson. You are the education specialist for that group?

Miss Henderson. Yes.

Mr. Meeds. Who are some of the members of that group?

Miss Henderson. It is not a membership organization. It is a group that has also been going like the union (IUCN) since 1948. It is a group of people working on different environmental problems. I am in education, we have a lawyer who did a conference on the law and the environment this fall. We have a couple of international ecologists who ran meetings on the ecological aspects of international development a year ago. We have planners, and those who work in citizen programs of various sorts and so on.

Mr. Meeds. How is it supported?

Miss Henderson. By private foundations and some individuals. The only Government money, I believe, at the moment, is an HEW grant for air pollution.

Mr. Meeds. Were you present the other day when Margaret Mead testified? In looking at your testimony, I assume you were?

Miss Henderson. I was there at the end of it. I wasn't there through all of it.

Mr. Meeds. I asked her a question which I am going to repeat very generally to you. I am just tremendously excited about all the interest we have in environment today. But somehow I have the feeling that this interest is a—I called it a middle-class ethic and I don't think she liked that terminology, but I am going to use it again because I like it.

I have the feeling that the drive for environment today is primarily a middle-class ethic and that we are overlooking or downgrading the very urgent problems of our cities and the very brutal environmental problems which exist there and we are thinking about conserving forests and cleaning up lakes and streams and all of these things.

But we are not concentrating on rats, garbage in hallways, and all of the problems that beset our core cities.

Miss Henderson. I personally believe this latter concentration is vital.

Mr. Meeds. My question is: Can we make this bill something which will also carry that concern and begin to respond to it or am I talking about another problem which maybe we ought to be dealing with in other legislation?

Miss Henderson. It is my personal belief that one has to look at the total environment. Since 70 percent or more of our citizens live in the city and more will in the near future, we are really obliged to look at the problem of the city almost first and foremost and look at the interplay between the rural areas and the city. We must look at the city environment and this immediately involves us in the interplay between man and nature and also technology.

I don't see how we can get out of this.

Mr. Meeds. I certainly agree with you. What I am really doing is kind of earnestly soliciting from all the witnesses I have had an opportunity to question, methods that we can better get this message across with this bill or some other legislation.

Miss Henderson. I suppose that perhaps you have to actively state it. I think the bill needs to make a reference to the fact that the kind of poverty areas we have in cities are, in fact, ecologically bad as well as all the other ways they are bad and that one needs to make this clear.

I think it is true, it is harder to get people in poverty to recognize that what we are saying is relevant to them as well as to us.

Mr. **Meeds.** My concern over this arose from a number of letters which I received from the students at Western Washington College, who were writing on another piece of legislation, but who seemed to have only the idea that the ecology and the environment was their ability to walk out their back door into the forests.

This was in relation, incidentally, to another matter in which I was actually questioning whether the ghetto youth of this Nation were getting a fair shake in the whole buildup on environmental problems. They just completely ignored it. It troubled me greatly, because it seems to me that the ghetto youth have as much right to a good environment as do the college students who want to walk out the back door and into the forests. We all want to do that.

Miss **Henderson.** I think their need is more pressing and we ought to acknowledge that.

Mr. **Meeds.** Thank you very much.

Mr. **Brademas.** Thank you, Miss Henderson. We appreciate your helping us.

Mr. **Brademas.** Our final witness this morning is Dr. Casey E. Westell, Jr. I am very pleased to call on a distinguished member of this subcommittee, Mr. Meeds, to present Dr. Westell.

Mr. **Meeds.** Mr. Chairman, I present Dr. Westell not from personal knowledge, but from recommendations of some very close personal friends who have recommended him highly, and having looked over his background, I can see why.

Dr. Westell this morning testifies on behalf of the American Forest Products Industries. These are industries which manufacture lumber, plywood, pulp, paper, and utilize a good share of the wood products and wood in the United States, both soft and hardwood, and I think probably a group which has as great a stake in the challenge of environment as any other group.

Dr. Westell comes to the committee this morning with a great deal of experience in this field. Dr. Westell, we are very happy to welcome you here.

STATEMENT OF DR. CASEY E. WESTELL, JR., GENERAL MANAGER, WOODLANDS PACKAGING CORPORATION OF AMERICA, FILER CITY, MICH.; ACCOMPANIED BY RALPH D. HODGES, JR., VICE PRESIDENT AND GENERAL MANAGER, NATIONAL FOREST PRODUCTS ASSOCIATION

Dr. **Westell.** Thank you.

Mr. Chairman and members of the subcommittee, with me is Mr. Ralph D. Hodges, Jr., vice president and general manager of the National Forest Products Association.

It is a distinct pleasure to be with you today to testify on H.R. 14753, the Environmental Quality Education Act. In the time allotted to me I will summarize the full statement I have prepared for insertion in the hearing record.

My name is Casey E. Westell, Jr. My occupation is general woodlands manager for Packaging Corp. of America, and my headquarters is in Filer City, Mich. Professionally, I am an ecologist.

I am appearing on behalf of the Forest Industries Council which is a policy-coordinating organization on resource matters for the

American Forest Institute, the American Paper Institute, the American Plywood Association, the American Pulpwood Association, and the National Forest Products Association. Together these organizations represent every facet of industrial forest management and forest manufacture in this country.

Since leaving military service at the end of World War II, I have been directly concerned with matters of forest ecology and environment. My degrees, including doctor of philosophy in Forest and Wildlife Ecology, are from the University of Michigan. Currently, I am a member of the cabinet-level council on Environmental Quality of the State of Michigan, a third-term member of the McIntire-Stennis Cooperative Forestry Research Advisory Committee of the USDA, and was a member of the committee which outlined the reorganization of the Michigan Department of Natural Resources.

Essentially, my testimony embraces four major points:

First, a challenge that the integrity of ecology as a science be maintained in programs, curricula and information emanating from this legislation. Our industry sees important benefits to be derived from a universal infusion of our citizens with the environmental facts of life. Education is needed to dispel the incredible ignorance and half-knowledge that exists even among our otherwise educated people.

It is vital, if we are to extricate ourselves from the many serious environmental and pollution problems that beset us. It is necessary, if our legislators are to have sufficient understanding to enact laws that will enable man to protect himself from himself. It is essential, if man is to improve his relationship with his environment in an orderly and rational manner rather than destructively as the result of the amateurish and emotional machinations of, perhaps well-meaning, but environmentally illiterate people.

Yet, all of our environmental efforts—whether they are within the scope of this legislation or otherwise—must be based on a solid foundation of the available technical and scientific knowledge. With this knowledge, we believe, an informed public will give its support and approval to solutions to our national problems of pollution and to the wise use of our natural resources.

In my own case, as an industrial forest manager responsible for over 210,000 acres of timberland that support thousands of jobs in processing and for manufacture, it is essential that I be among those most sensitive to changes in the environment. The Nation's foresters and other personnel—many of whom are professionally trained experts in ecology—are the stewards of the millions of acres of industrial and Government forests. One-third of our Nation is forested.

The "Paul Bunyan Syndrome" of irresponsible loggers and exploited forests is a part of history, repugnant to our ideals and contradictory to our profession and contemporary practices. The art of silviculture (producing and caring for a forest) today has infinitely more basis in scientific method and technology—and its practitioners have more professionalism than ever before.

Yet the application of new scientific methods of forest management in this country, we believe, has been handicapped because of lack of understanding and knowledge on the part of many of our citizens.

For example, my statement refers to a number of widely believed myths and misconceptions on just the limited subject of redwood trees. The task of our industry functioning in the midst of environmental illiteracy can be extremely difficult, and on occasion, impossible. Some of us believe that in our present society and educational system, our yougsters know all about sex before they get to the birds and bees, and too many never do get to the flowers and trees.

The second part of my testimony deals with a number of educational projects and activities initiated and administered over the past 25 years by forest products companies and associations. Programs are continuing in conjunction with local schools, school districts, State education systems, colleges, universities, local units of government, conservation groups and women's organizations.

I call your attention to them for they are quite wide ranging. They include field study trips; various types of tours of private industrial forests, plant operations and logging camps; teacher training centers, workshops and seminars; and multitudes of printed, audio, and visual educational materials and teaching aids.

For obvious reasons, most of these educational activities have taken place in forested areas of the country. This is changing, and a beginning has been made in introducing some of these activities to urban areas. I feel very strongly about the importance of ecology in the urban areas, and the demonstration forest idea is one such project which could be transplanted anywhere in the country where there are existing tree farms. A few acres of timberland or even a large available field where a miniature forest could be developed would help, provided suitable sponsors and technological assistance were readily available.

Ideally, a demonstration forest could provide extensive educational experiences for all age groups, including demonstrations of proper silvicultural practices from the gerination of the seeds to final harvest. For example, it would be possible to show how thinning improves a timber stand; how trees are identified; how insects and diseases affect trees; the ecological life of a forest that might include its function as a watershed, a habitat for wildlife, its relationship with a stream or lake; and basic instruction in meteorology and soil science.

A unique, urban demonstration forest is now in its 2d year in Los Angeles. It occupies land bordering the Hollywood Freeway and several lots owned by Universal Studios, one of its sponsors. Other sponsors are the forest product industry, Los Angeles City and county schools and the Los Angeles County forestry department.

In Michigan we have a dynamic program of school forests and professional foresters have been guiding the program for years.

My third point is in regard to the language of the bill. While its purposes are clear and constructive, we suggest several improvements.

We would recommend that section 2 be amended by the inclusion of a subsection (c) which would spell out in clearly defined language the objectives of the legislation. The terms "environmental quality" and "ecological balance," while perhaps convenient shorthand labels, are too subjective and open to too many interpretations to be useful.

Section 5 only broadly establishes the qualifications for members of the critically important Advisory Committee on Environmental Quality Education. The language in the bill:

> . . . persons familiar with education, information media, and the relationship of man as producer, consumer, and citizen to his environment and the Nation's ecology.

Should be amended to show the qualifications of each of the various members so that the advice of the committee will merit the highest possible respect and attention.

I have served as a member of the McIntire-Stennis Cooperative Forestry Research Advisory Committee since its formation in 1962. My experience there compels me to commend that portion of the enabling act which prescribes the composition and authority of the advisory committee.

Specifically, the act establishes the representation by agencies and interest groups and spells out a balance. The greater breadth of the legislation you are considering, would seem to require that the act specify that the Secretary of Health, Education, and Welfare appoint members from the specified categories that fit the objectives of the bill. We, for instance, would like to see representation for:

First, primary industries directly concerned with land use, such as agriculture, forestry, mining, petroleum, and grazing;

Second, other manufacturing industries whose operations directly involve important environmental considerations such as automotive, chemicals, paper, food processing, and metallurgy;

Third, antipollution agencies of Federal, State, county, and municipal govrenments, including the Public Health Service;

Fourth, educational institutions, the media, consumers, and the general public, with the chairman being selected from this group;

Fifth, housing specialists and urban and rural planners.

Such a distribution of influence among these several categories would assure that programs would be focused upon common, attainable objectives without regard to special interests. Also this would keep the programs in touch with the realities of technology and economics.

Recommendations of the best-qualified persons to be appointed to the advisory committee should be solicited by the Secretary from among the groups cited. The committee should be given specific authority in relation to the Commissioner because of the unique aspects of Federal involvement in curriculums.

Public Law 87-788, which established the McIntire-Stennis Advisory Committee for federally assisted forestry research at land grant colleges, and Public Law 91-211, which created the Advisory Council for federally assisted mental health programs, are excellent examples of legislative description of the membership and duties of advisory councils. An environmental quality education advisory committee formed along these lines would go a long way toward assuring maximum acceptance of the concepts of this legislation and cooperation with citizen, educational, manufacturing and other organizations.

Mr. Chairman, the forest products industries are, as I have indicated, deeply involved with environmental quality and ecological balance. We are agriculturists on a grand scale concerned with crops taking 50 years and more to mature. We are manufacturers concerned with the environmental consequences of our processes. Additionally, we make substantial material contributions through our forest management activities and our products to the general standard of living, which must be considered a fundamental aspect of our national environment.

We believe in educational programs to acquaint all Americans with the scope of environmental and ecological problems, with their personal and collective dependency upon solution of those problems, and with the inter-relationships which must be developed among education, science, technology, and communications if we are to make meaningful progress.

The legislation being considered here today represents a basis for responsible approaches to citizen understanding of and citizen participation in these complex matters. With appropriate amendments to marshal highly qualified advisory direction, we are confident that this proposed legislation will make substantial contributions to the national welfare.

The forest products industries are pleased that we have been given the opportunity to share our information and ideas with you here today.

Thank you.

(Complete statement follows:)

STATEMENT OF DR. CASEY E. WESTELL, JR., GENERAL WOODLANDS MANAGER, PACKAGING CORPORATION OF AMERICA, FILER CITY, MICH.

Mr. Chairman, members of the subcommittee, it is a distinct pleasure to be with you today to testify on H.R. 14753, the Environmental Quality Education Act.

My name is Casey E. Westell, Jr. I am General Woodlands Manager for Packaging Corporation of America, and my headquarters is in Filer City, Michigan. I am appearing on behalf of the Forest Industries Council which is a policy coordinating organization on resource matters for the American Forest Institute, the American Paper Institute, the American Plywood Association, the American Pulpwood Association, and the National Forest Products Association. Together these organizations represent the various facets of industrial forest management and forest products manufacture in this country. As an element of their resource responsibilities, they are directly concerned with the environmental aspects of timber growing, cultivation, harvesting and conversion into more than five thousand useful products.

My qualifications as spokesman for these groups rest upon my longtime participation in the activities of the American Pulpwood Association and the American Forest Institute, my professional activities, and my educational training.

Since leaving the military service at the end of World War II, I have been directly concerned with matters of forest ecology and environment. I hold the degrees of Bachelor of Science in Forestry, Master of Wildlife Management, and Doctor of Philosophy in Forest and Wildlife Ecology, all from the University of Michigan.

Currently, I am a member of Governor Milliken's cabinet-level Council on Environmental Quality of the State of Michigan, a third-term member of the McIntire-Stennis Cooperative Forestry Research Advisory Committee, and a member of the Michigan Natural Resources Council. I am a director of the Michigan Association of Conservation Ecologists and of Trout, Unlimited, which I served as its first president for four years. I am also a member of the Society of American Foresters and the Wildlife Society. In 1963, I was appointed by Governor Romney as a member of the Conservation Study Committee which resulted in the reorganization of the Michigan Department of Natural Resources. I have written and lectured extensively in my fields of interest.

From 1951 to 1954, I held research and teaching posts in forest and wildlife ecology at the University of Michigan. The following year I conducted research in forest ecology for the U. S. Forest Service and then joined Packaging Corporation of America in 1955 as a research forester. In 1956, I began five years as the corporation's forest and wildlife ecologist, then served as chief forest ecologist until 1965 when I became general woodlands manager, the post I now hold.

In detailing my background, it has not been my intention to parade personal accomplishments. Rather, I had hoped to establish for this committee that industrial personnel, by reason of training, responsibilities and citizen participation, devote themselves to the public interest on a broad base as well as to the immediate benefits of their employers.

The forest products industries, more than most, are dedicated in principle as well as for sound woodland management reasons, to quote the language of the bill, "to enhancement of environmental quality and ecological balance."

It is our earnest hope that the fundamentally sound purposes of H.R. 14753 will convey these facts to all the people through effective educational programs and prompt citizen support of modern forest management activities on all commercial timber lands, both public and private.

H.R. 14753 can be an effective means of advancing public understanding of environmental problems, and what can be done about them. Federal support for development of curricula and course materials is a different approach than Congress has commonly taken in the past, when it has enacted programs designed to strengthened instruction in given subjects through grants to state education agencies. Nonetheless, the approach is not unknown.

The McIntire-Stennis Act (P.L. 87-788, 87th Congress, October 10, 1962) is a classic example of effective coordination of federal educational objectives, funding, and advisory management. I shall speak to its application to H.R. 14753 at a later point. This precedent establishes the important fact that the parties who hold the key to environmental quality should be part and parcel of the development of such curricula. Otherwise, we will wind up teaching theories in the classroom that bear little relationship to what is happening, and to what is possible.

Representatives of industry, trade associations, municipal water and waste disposal agencies, regulatory bodies, and the Public Health Service should be among those who take part in any realistic appraisal of environment, and its enhancement. Moreover, they are the source of enormous knowledge of what the problems are, technically and economically.

There is scarcely a manufacturing industry, or extractive industry, that is not affected by the national concern for resources and environmental quality. Some in industry are far more concerned than the public is about diminishing resources, their conservation, and their replenishment. Industry bears a major responsibility for the quality of environment. It would seem logical, therefore, that industry be a participant, not only in finding the means of controlling pollution and ecological imbalance, but in educating the public to the issues.

Essentially, my testimony embraces four major points:

First, a challenge—or admonition, if you will—to set and maintain from the outset only the highest and best of professional standards for teaching and disseminating information about environmental quality and ecology.

Second, a brief presentation of some of our industry's experiences and efforts in environmental education over the years.

Third, some recommendations with respect to the legislation itself.

Fourth, some specific offers and suggestions as to how the American forest products industries can be helpful in assisting and advancing the worthwhile aims of this legislation.

Gentlemen, logging is one of the oldest industries in North America. It is believed that Indians logged the Southwest 4,000 years ago and that Norsemen cut timber in the Northeast several hundred years before Columbus arrived here.

Forests are basic to our environment, and, happily, they are a renewable natural resource. They are at once the home of wildlife and watersheds, living factories consuming carbon dioxide and producing oxygen, scenes of beauty and sites for recreation, as well as the source of timber for building and renewing man's own habitats—his homes and his cities—and for supplying him with thousands of wood products.

The art of silviculture (producing and caring for a forest) today has infinitely more basis in scientific method and technology—and its practitioners more professionalism—than ever before. Where once Indians set fire to dense, old growth forests to aid their regeneration and provide browse for animals, we prune, thin, harvest and employ other proven timber improvement practices. Where once the early settlers and our forefathers depleted forests in the East and Midwest as they moved westward settling the country, we are reforesting our private industrial timber lands at a higher rate than we are harvesting.

In the South, the same pattern has occurred. Intensive timber management has enabled the South to regrow timber at a rate which permits harvesting of its second forest now and, at the same time, provides for planting the third forest.

Today, thousands of industry foresters plant, thin, fertilize, harvest and regenerate their tree crops for the present and future use and enjoyment of man in accord with conservation values and other multiple factors of the environment. Foresters have to be professionally trained experts in ecology and are among the most sensitive to changes in environment. We foresters, directly and indirectly, are the ones closest to and most careful about the proper management of our timber lands. For we are the stewards of most of the government and industrial forest lands in this country.

The "Paul Bunyan Syndrome" of irresponsible loggers and raped forests is a part of history, repugnant to our ideals and contradictory to our contemporary practices. In fact, a primary reason for our industry's support of the principles of this Act is an overriding desire to dispel with facts and truth the confused tangle of myth, ignorance and misunderstanding about forest resources which dominates the attitudes of millions of Americans.

Potential progress in forestry, particularly in our publicly owned timber lands and in the application of new scientific methods of forest management in this country, we believe, has been handicapped because of lack of understanding and knowledge on the part of many of our citizens. Not a few of those opposed to more progressive forest management are Members of Congress, and, therefore, obliged to make decisions on laws affecting our forest resources.

Allow me to illustrate how the task of our industry functioning in a setting of environmental illiteracy can be extremely difficult, and on occasion, impossible.

Perhaps, nowhere has public misunderstanding been greater than in connection with the redwood trees. Many believe they grow only in Northern California, but they actually thrive on five continents. Many believe redwoods are in danger of disappearing, but foresters calculate there may be more redwoods now than when man began to utilize them. Many believe they are the oldest living thing on earth, but they are the fourth oldest known species of tree in California. Many believe that redwoods living today were here "when Christ walked the earth," but the greatest age so far determined by an actual count of the growth rings is just over 2.200, the conclusion of a half century of sampling and studies shows less than three percent of the old growth trees are over one thousand years old, and the lifespan maximum is normally from five hundred to eight hundred years. Many believe the forest products industry cares only about cutting down trees, but many of the majestic groves of superlative redwoods in 29 State parks and the new Redwood National Park in California were either donated by private redwood companies or were set aside from cutting in cooperation with the Save-the-Redwoods League and the State of California while the companies continued to pay the taxes on the land for decades. Many believe that natural growth trees are somehow special, but under the scientific management practices of privately owned producing forests, new young-growth redwoods may equal the height of the mature giants in less than a man's lifetime.

I would submit, gentlemen, that if the foregoing opinions were put in the form of a quiz, hardly one person in one hundred could come up with the right answers. Yes, our industry welcomes and unhesitatingly supports environmental education programs that will provide our citizens with the environmental facts of life. Some of us believe that in our present society and educational system our youth know all about sex before they get to the birds and bees and too many never do get to the flowers and trees.

Exceptionally few graduates of our public, and private schools today have even a minimum appreciation or understanding of the basic facts of the ecological web of life and man's place in it. So long as man does not possess these facts, he will continue to defy and to destroy nature. He will not even have sufficient knowledge to enact appropriate laws to protect himself from himself.

Equally disturbing is that many of these environmentally illiterate people, while honestly concerned about pollution and other environmental problems, will strike out at superficial symptoms while ignoring the disease itself. In the long-term, our environmental problems can only be solved by those with competence and training in environmental studies.

The challenge our industry makes to you who are writing the legislative history of this bill and to those who will administer it is to maintain the integrity of ecological science so it will be well prepared to serve and guide our actions in this area. Emotional responses to real problems can be wholly destructive.

In a prophetic introduction to a book entitled "Ecology" by Peter Farb and the editors of Life Magazine published in 1963, Prince Bernhard of The Netherlands, then president of the World Wildlife Fund, said, "Ecology, in the next 10 or 20 years, may well become the most popular of sciences—a household word to those masses who today are ignorant of both the word and its meaning." Significantly, we think, he added, "It is much to be hoped, however, that such an aroused interest will not affect pure ecology as a science by diluting it to an amateurish half-science that appeals to the masses."

In a recent lecture at the Smithsonian Institution, Dr. Rene Jules DuBois, a microbiologist, experimental pathologist and Pulitzer Prize winning author, contrasted differing attitudes toward nature in these words: "On the one hand, passive worship; on the other, creative intervention."

Obviously, an eroded farm or hillside could not be an object of passive worship to anyone. But, a forest not only could be, but is, an object of passive worship to a number of rational Americans.

Naturally, we have very definite ideas as to which of these conflicting philosophies—passive worship or creative intervention—can result in greater benefit to a greater number of people as well as being an environmentally sound concept. We are willing to take our chances in an ideological arena open to inquiry and unrestricted to new ideas and information in the truest sense of academic freedom.

In other words, we are convinced that, in the long-term, environmental education will mean a triumph for rational discourse and treatment of our national problems of pollution and protection of our natural resources.

Forests, we believe, occupy a particular environmental niche because they are a renewable resource. Wise use of forests, not preservation, means that man is able to consume timber for the benefits it provides even as he increases the total supply of that natural resource.

We cannot help but believe that the environmental literacy of our citizenry is the key to the successful solution of the problems largely created by man, not always because he did not care, but because he did not anticipate the full consequences of his honestly motivated actions. While we do not look upon education as a magical cure for all of our ills environmental or ecological, without it, we believe, we cannot hope to succeed in this national obligation.

Our own industry's efforts over the years in a wide variety of environmental education programs is proof of our confidence that the best interests of our country and our industry are best served by an informed public. A better understanding of the fantastic possibilities and opportunities in modern, scientific management of our forest resources will benefit all of us. It is this premise which underlies the educational and informational programs currently being undertaken by our industry.

Hundreds of forest products companies and associations are engaged in a wide range of projects and activities initiated and administered by themselves or in conjunction with local schools, school districts, state education systems, colleges, universities, local units of government, conservation groups and women's organizations.

In the Northwest, for example, each year about 40,000 Oregon and Washington sixth-graders are taken into the forests for full-day conservation field trips. Manpower for the program is largely provided by the forest industry in cooperation with several governmental agencies.

In Oregon, a current survey reveals a wide range of activities benefitting both students and teachers. Several companies have agreements with local schools and school districts for field study trips to private industrial forests. One company is developing a teacher training center in conservation education on an island in the Puget Sound area; another hosts an annual teachers workshop at its experimental seed orchard. A number of companies sponsor tree planting days for school children, one of these programs dating back to 1945. Many companies provide conservation education packets for teachers and students, answer student information requests, and make available films and speakers upon request. One company provides teaching aids for school use in connection with woods-and-plants tours at all its operating branches. Several companies and associations provide resource specialists who teach in as many as ten conservation education workshops in the Northwest.

In California, 60 underprivileged high school children participate in a 10-week environmental study course held during the mornings at various conservation clubs and in the afternoons at a forest products corporation's logging camp. A paper company recently completed a 12-day environmental seminar for children of its employees, including a tour of its mill and water pollution control facilities. A three-day annual redwood region Junior Logging Congress involves 100 high school forestry students. Also in redwood country are six redwood demonstration forests, sponsored by various companies, which are visited by some 100,000 persons each year. Just next week, another demonstration forest on a portion of a privately-owned tree farm will be dedicated with the planting of seedlings and it will eventually become public.

In Illinois, a tree farm well-known to Illinois youngsters and adults is operated under multiple use management and features a demonstration forest, identification of trees, a saw mill and other learning experiences which can be seen in person or read about in an explanatory booklet.

In Wisconsin, a paper firm cooperates with a state university in sponsoring a twice-a-year conservation program and field trip for prospective biology teachers and a seminar for faculty members. Another paper company has developed two do-it-yourself tours—one by auto, the other walking—used by thousands of students and teachers as well as Boy Scouts, Girl Scouts and conservation groups. A colored slide presentation, based on the tours, is available to schools. Several companies produce educational materials for various grade levels.

Many similar programs are conducted in other states in the West, Midwest and South. For obvious reasons, the preponderance of the individual company sponsored educational activities has thus far occurred in forest areas. We have other programs for introducing these activities to urban areas. Most are sponsored by the major forest industry associations which generally have at least one executive skilled in working with the schools. The American Forest Institute sponsors the TREE FARM Program, KEEP GREEN Program and promotes forestry in every state through schools, Boy Scouts, 4–H Clubs, Future Farmers of America and through garden and women's clubs. This organization is 25 years old and has spent many millions of dollars in educational work.

The so-called demonstration forest idea is a project which can be transplanted anywhere in the country where there are existing tree farms, a few acres of timberland or even a large available field where a producing forest could be developed, provided suitable sponsors and technological assistance were secured.

Another demonstration forest on a tree farm in the West defines the scope of education possibilities in such a project. There, thousands of teacher-escorted school children have followed well-marked trails to areas which identify different species of trees, show how thinning improves a timber stand, and instruct about wildlife prevalent in the area with actual stuffed animals and birds. The visitors can see a weather station where they learn aspects of meteorology and an artificial lake stocked with fish. They can observe small trees growing in a nursery, and they learn about diseases that affect trees in a special "hospital."

Such living education experiences need only be adapted to available land in or near urban and metropolitan centers. Recently, Los Angeles primary graders planted 100 pine seedlings on a steep slope bordering the Hollywood Freeway to launch the second session of a unique urban demonstration forest project jointly sponsored by Universal Studios, the forest products industry, Los Angeles City and County schools and the Los Angeles County Forestry Department. During the 1968–69 school year, about 1,000 seedlings were planted in four studio lot areas, with an excellent survival rate reported. The school children are enjoying an outdoor educational environmental experience of growing their own forest and learning the multiple use benefits of wood production, watershed protection and wildlife improvement. Long-range plans call for development of nature trails and more sophisticated ecological and environmental study experiences.

The Southern Forest Institute helps sponsor forestry summer camps for high school students on demonstration forests in most states from Texas to Virginia. Trees for Tomorrow, Inc., sponsored by pulp and paper companies in Wisconsin and neighboring states sponsor summer training for high school teachers in forestry, game management and conservation.

Right here in the District of Columbia's Rock Creek Park is a federally sponsored nature study center and marked nature trail which might easily be upgraded and expanded.

In brief, our forest products industries have pioneered in environmental and ecological education and will surely cooperate in programs to extend the scope of public understanding of the relationship between vigorous forests and dependent man.

We believe that industry could better lend its resources to helping carry out the purposes of the bill if section 2 was amended by the inclusion of a subsection (C) which would clearly define the meanings of the terms "environmental quality" and "ecological balance" so that activities provided for in the legislation could be directed towards positive goals.

The popular understanding of what these terms embrace has, as I have pointed out, caused confusion.

Further in the statement of findings and purposes, adequate reference should be made to the economic aspects of environment and ecology as a safeguard against misconceptions which might tend to deny the Nation the financial incentives and means to accomplish the worthy environmental and ecological purposes envisioned by the legislation.

With respect to forest management, for instance, it is wholly feasible to apply sound practices which will enhance, maintain and restore environmental quality and ecological balance. This can be done, however, only if management of timber resources allows fulfillment of the Nation's material requirements. The dollars generated by modern forest management, in the final analysis, are the principal source of funding for those activities which represent the other benefits of the forest: fish and game management, watershed management, recreation, and forage. Each of these other desirable uses is derived directly from timber production; without timber management they are neither likely to be accomplished because of lack of funding nor are they attainable in areas barred from timber production.

The McIntire-Stennis Act of 1962 offers a good example of how this bill might be amended to better accomplish the objectives. Public Law 87–788 authorizes the Secretary of Agriculture to encourage and assist the land grant colleges in carrying on a program of forestry research. It was conceived of as a means to accomplish within that relatively limited sphere what H.R. 14753 is designed to do within the broad terminology of "environmental quality" and "ecological balance" in terms of education.

Perhaps the most significant aspect of the McIntire-Stennis Act, and I commend it to this subcommittee's attention, is the composition and authority of the advisory committee.

Whereas, H.R. 14753 in Section 5 provides for establishment of an advisory committee which can advise, recommend, review, and evaluate, various aspects of the programs involved, it grants no specific authority. Neither does it establish meaningful criteria for composition of the advisory committee with this language:

> Persons familiar with education, information media, and the relationship of man as producer, consumer, and citizen to his environment and the Nation's ecology.

The McIntire-Stennis Act provides in Section 5:

> Apportionments among participating states and administrative expenses in connection with the program shall be determined by the Secretary after consultation with a National Advisory Board of not less than seven officials of the forestry schools of the state-certified eligible colleges and universities chosen by a majority of such schools . . .

At Section 6 it states:

> The Secretary is further authorized and directed to appoint an advisory committee which shall be constituted to give equal representation to federal-state agencies concerned with developing and utilizing the Nation's forest resources and to the forest industries. The Secretary and the National Advisory Board shall seek at least once each year the counsel and advice of the Advisory Committee to accomplish effectively the purposes of this Act.

The significance of the McIntire-Stennis advisory system cannot be overemphasized. For the first time the federal government was directed by law to appoint an advisory committee including one-half representatives of the industry and to seek their counsel and advice. Previously industry advisory groups were established, altered, abolished and considered at the whim of the administrative agencies. They were so handled that they constituted a "rubber stamp" for agency plans.

Experience under this system, and I am a member of the McIntire-Stennis Advisory Committee, has resulted in full and constructive participation by the interested industry, by the educational institutions, and by the federal agency involved to the benefit of the overall program.

A number of statutes affecting both education and public health apply the same yardstick to advisory committee members in the interest of positive program accomplishment.

A single example in the area of health will demonstrate the trend towards expertise among citizens designated to advise federal officials and monitor federal programs. National advisory councils are dealt with in the Public Health Service Act, at Section 217(a) of 42 U.S.C. 218 as follows:

> The National Advisory Health Council, the National Advisory Cancer Council, the National Advisory Mental Health Council, the National Advisory Heart Council, and the National Advisory Dental Research Council shall each consist of the Surgeon General, who shall be chairman, the chief medical officer of the Veterans' Administration, or his representative and a medical officer designated by the Secretary of Defense, who shall be ex officio members; and twelve members appointed without regard to the civil service laws by the Surgeon General with the approval of the Secretary of Health, Education, and Welfare. The twelve appointed members of each such council shall be leaders in the fields of fundamental sciences, medical sciences, or public affairs, and six of such twelve shall be selected from among the leading medical or scientific authorities who, in the case of the National Advisory Health Council, are skilled in the sciences related to health, and in the case of the National Advisory Cancer Council, the National Advisory Mental Health Council, the National Advisory Heart Council, and the National Advisory Dental Research Council, are outstanding *in the study, diagnosis, or* treatment of cancer, psychiatric disorders, heart diseases, and dental diseases and conditions, respectively. In the case of the National Advisory Dental Research Council, four of such six shall be dentists.

Federal dependency upon these experts is such that the Community Mental Health Centers Act has recently been amended to include a section 266 regarding approval of grants by the National Advisory Mental Health Council. It reads:

> Grants made under this title for the cost of construction and for the cost of compensation of professional and technical personnel may be made only upon recommendation of the National Advisory Mental Health Council established by section 217 (a) of the Public Health Service Act.

The forest products industries believe that the breadth of the impact of the programs envisioned under the environmental quality education act requires equally careful development of advisory committee membership and individual qualification to assure that all appropriate disciplines are represented. Industry, particularly primary industries, such as those directly concerned with land use involving raw material supplies should be individually represented. Among these would be: agriculture, forestry, mining, petroleum, grazing. Other manufacturing industries involving environmental considerations and striving to overcome deficiencies should be active members: automotive, chemicals, paper, food processors, and metallurgy. States, counties, and municipalities deserve participation through their anti-pollution agencies. The Public Health Service should be represented. Educational institutions, the media, and general citizens should comprise a fourth category with the chairman being selected from among the latter group. The distribution of influence among these several categories would assure that programs would be focused upon common objectives without regard to special interests nor removal from the realities of technology and economics. Recommendations as to qualified personnel to be appointed to the advisory committee should be solicited from among the groups cited.

Environmental considerations, like public health, concern all citizens and are of such consequence that they must be dealt with by those highly qualified to make informed judgments.

Mr. Chairman, because we are convinced of the need to improve the level of environmental literacy and respect which is the purpose of this legislation, I wish to suggest several ways in which the forest products industry can render assistance and support.

First, we will consider the addition of educational representatives to a proposed nationwide network of local and regional environmental improvement committees currently being formed within our industry. These committees would be uniquely qualified to render professional assistance to elementary and secondary schools, colleges and universities, and sponsors of community conferences on the environment participating in programs under this Act. We will further consider the establishment of a National Environmental Education and Improvement Board within the forest industries which will coordinate the activities of the local committees while serving as a resource center. The information and assistance of this National Board would be made available to Federal, State and local governments, school districts, universities, non-profit organizations, the media and other groups involved in environmental education programs under the provisions of this Act or otherwise.

Second, we will solicit the industry to inventory ways we are presently involved and how we can participate in environmental education programs. We need to know the extent to which there are present or future commitments of forest acreage, facilities, funds and/or personnel. I have already cited a number of specific examples of educational experiences in which the industry is engaged. These could be expanded, modified or increased, and new projects added. For instance, a study-work-recreational program for students, dropouts or the unemployed is now under industry consideration and pilot projects are about two years old. Our findings could be used by those administering this Act to help determine where and to what extent their educational programs could avail themselves of private industrial forests, forest facilities and appropriate industry personnel.

Third, upon enactment of this legislation, we will offer to the Secretary of Health, Education and Welfare a list of names of individuals both from within our industry and outside who would be eminently qualified to serve as respected and responsible members of the advisory committee on environmental quality education.

We sincerely hope that in these several ways we can help contribute to the success of the objectives of this legislation.

I appreciate the opportunity to share our ideas and comments with you today.

Mr. **Brademas.** Thank you very much, Dr. Westell.

Dr. Westell, from your own broad experience and educational background, I wonder if you could tell us how you would characterize the present obviously very sharply rising concern about what has come to be called the environmental crisis?

Dr. **Westell.** I am hopeful that the net effect would be beneficial and good. I am apprehensive of the awareness taking on a fad status and I am encouraged to see this attempt at this level simply to prevent this from happening.

I think it is high time the public becomes interested, but these ideas, these programs and suggestions coming from ecologists and others are not new or innovative. People have been writing for 30, 40, 50 years, warning that these situations were developing and these crises were upon us or would be soon. So that, yes, professionally I say this effort is very good, very beneficial.

Mr. **Brademas.** How serious do you think the environmental crisis is in this country?

Dr. **Westell.** It is serious, it is a crisis, but I am not numbered among those who are saying doom will be here 10 years from now if we don't act today.

There are possibilities for programs that can renovate, reestablish and renew, and these need particular emphasis.

In the areas of my competency, we are dealing with renewable aspects and we have been for a long time. We are in better shape than in some other areas of ecology.

Mr. **Brademas.** How do you explain, because this is an area to which you have given your whole professional life, this sudden burst in the United States of concern about pollution and damage to the quality of the environment?

Dr. **Westell.** I think our technology, our standard of living and population growth have all been dramatic and remarkable. Because of this, the awareness came simply because of the magnitude. You aren't concerned particularly with one junkyard in a county, but if you have 10, then this becomes an obvious eyesore and a problem.

You aren't concerned with the pollution of one stream if the dilution is satisfactory, so that it is not a biological or a health problem. But when all streams are receiving an overload, then people become aware. I think particularly in the Eastern United States this is obvious.

I flew over much of the country yesterday coming in. Over our large cities it is quite obvious but many of these problems are subtle, and it takes trained professional observation. Until these problems became evident to the average citizen, you didn't have this awareness and crisis attitude.

Mr. **Brademas.** Are institutions and persons identified with the Forest Industries Council's participating in the teach-in in a couple of weeks?

Dr. **Westell.** Yes. To a great degree. My staff is almost totally involved. We have been called on at numerous times from all levels. This is not new in the forest industries, because information programs have been carried on for 25–30 years in most areas of the country.

Mr. **Brademas.** I noted you gave particular attention in your statement, Dr. Westell, to the composition of the advisory council contemplated in the bill and that you suggested that there should be spelled out representation for the several primary industries in the United States.

How would you decide which industries ought to be represented? All of them?

Dr. **Westell.** I can't give you a clearcut idea on all industries that should be represented. Our feeling is that the primary ones—agriculture, forestry, and others regarding our natural resources and then manufacturing—should receive some recognition.

Whether this is one individual or two, I wouldn't be prepared to say at this time except that we feel strongly that these areas have real contributions to make to the teaching of ecology and environmental sciences. They should be called upon formally by such legislation to make these contributions, to make sure that the latest knowledge, technology, and practice is being infused into the curriculums, if this is the route the legislation will take.

Mr. **Brademas.** It is, I think, somewhat more complicated. On a commonsense basis, we ought to stay away from your own industry for a minute, to try to be more completely objective about it. You take mining, which is a primary industry.

Unless you have a 100-man advisory council, in which case it gets rather cumbersome, whom do you put on it? Do you put the mineowners or the mine, mill, and smelter workers, or do you put a member of the United Mine Workers on?

Dr. **Westell.** I don't think that is quite the problem; rather, it is to get someone competent in mining. He could be an employee of the industry directly, or indirectly, or he could be a professional person that works with the industry. He could be a professor from a university.

But the idea is that the practice, the technology, and the philosophy of mining and all the other things that go along with it are somehow considered formally in the teaching of environment. It is an extractive industry, but they have enlightenment in the area of conservation and have had for years.

Mr. **Brademas.** I am afraid you really got me down the wrong path with that point of view. I was quite interested in your statement on page 11 that "Previously, industry advisory groups were established, altered, abolished, and considered at the whim of the administrative agencies. They were so handled that they constituted a rubberstamp for agency plans."

From my observation around this town, that is 100 percent wrong, that it is the other way around and that is causing profound apprehension in this country right now. I am not talking here particularly about forestry, about which I really don't know very much about at all. Mr. Meeds is very well informed on that. You can take a whole variety of regulatory agencies in the United States and I think that what is causing as much concern on the part of so many people in this country is that the regulatory agencies have been captured by the industries that they are supposed to regulate.

Anybody that doesn't know Washington, D.C., doesn't know the first thing about the American political system. You could rattle off almost every major economic activity in the country and make that point.

I am not going to bother to name names here this morning, but you can't pick up a newspaper in this town these days, without seeing more evidence of the validity of this proposition. So I am not singling out forestry for any particular criticism in this respect, but I guess what really fills me with the most profound apprehension is turning the public policymaking control in a program of this sort over to those whose record has, in part, been responsible for our needed programs along this line.

That isn't to say that I don't think we ought to open our eyes and ears to whatever views and information may be able to be afforded by a particular industry. But I really grow apprehensive at the kind of suggestion that you make here, to be very blunt about it.

We write an environmental education program and then we turn it over to the polluters. I don't understand that.

Dr. **Westell.** I can't speak for all segments of the industry and I am certainly not going to defend all of the other areas you have introduced here. But if this advisory committee appointment was to a competent, dedicated, and proven professional, there isn't any professional that I know that can be controlled in the professional matters by his employer.

Mr. **Brademas.** There isn't?

Dr. **Westell.** Not in professional competency. I am a manager, and I am subject to the pressures or to the instructions of my superiors in the conduct of the business. But my employer doesn't dictate my professional conduct. He never has in 15 years and never will.

My point is simply this: I am approaching the problem academically on a professional basis. Whether I am a professor in the university or an employee in the industry shouldn't have that impact on my professional conduct.

If it does, it is reprehensible and the man is not truly a professional. So I would ask you to examine the appointments on that basis and go, for instance, now to the McIntire-Stennis group, which has seven industrial appointees and seven from public life. There have been no conflicts. I simply say, "Look at it, talk to the people involved, talk to the USDA and see whether there has been serious conflict." It has been quite gratifying to me. I think that here is the first time in my career where I can get up at professional meetings, at industrial and public meetings and say, "McIntire-Stennis is really getting its money's worth for the people in this country and deserves your support."

It is something of a paradox, asking for more money, more taxes; however, I am confident that the money is being spent properly.

Mr. **Brademas**. I appreciate what you are saying. I don't want to be disagreeable about it, but the difference between you and me is I believe in original sin. All you have to do is pick up the paper about a week or so ago, and look at the jobs taken by former members of the Interstate Commerce Commission. Where do you think they go to work, for the American Forest Products Industry? They go to work for the buslines, they go to work for the trucking lines, they go to work for the railroads.

That is not a syndrome calculated to inspire confidence in me in the integrity of these regulatory commissions and the same point could be made with respect to the Federal Communications Commission. Everybody knows that around this town.

I am not saying anything that ought to be the most astonishing—I don't want to badger you about this. All I am saying is that I think it would be the kiss of death to this legislation if it appeared that in an effort to educate Americans about the dangers to our environment, we were to stack the Advisory Council with persons who could not unfairly be represented as being captives of some of the major economic activities in the United States that had by virtue of their failure to adopt more ecologically sound practices led to this burgeoning crisis in the United States and the enormous sense of public outrage.

I think you can understand my point of view, even if you don't agree with it.

Dr. **Westell**. You are the professional in this. Can't you conceive of a structure, of a balance that would preclude this possibility as it has in, say, the McIntire-Stennis?

Mr. **Brademas**. Yes, I think your point is very well taken there, Dr. Westell. I would not want to lead you to think for 1 minute that I would be opposed to representation from industry on such an Advisory Council. I don't think that would be fair either.

All I do want to get across is I think we have to be very careful, not only to be as pure as we can be, but to appear to be pure, if we are going to have public confidence in the integrity of the programs that are authorized under this bill.

So I like to think that we are not quite that far apart as our colloquy might indicate.

But your suggestions have been most stimulating and interesting.

I now turn to the real authority on this committee on trees, the gentleman from Washington.

Mr. **Meeds**. Thank you, Mr. Chairman.

Dr. Westell, I am very happy that the chairman asked and that you people have responded by having before this committee a professional forester. I think it is essential that this be done.

In this connection, I would like to ask you this: I was advised recently by the Forest Service that there are 5 million acres of timberland that have been cut over in the past few years which have not been replanted. Does that sound like it is in the ball park?

Dr. Westell. Yes.

Mr. Meeds. Can you tell us the effect on the quality of the air we breathe, the soil erosion that occurs, the lack of watershed protection that occurs when 5 million acres remain unplanted and unforested which at one time bore softwood forest products?

Dr. Westell. As a generalized answer to this question——

Mr. Meeds. It is a very general question.

Dr. Westell. There are more acres that are cut properly and are regenerated properly than are done improperly.

Not all acres that are logged need to be replanted with trees, you know. We have a lot of natural regeneration.

Mr. Hodges. The statistics you refer to are the 5 million acres of unstocked lands on the national forests. In addition, there are some 12 to 15 million acres that are in need of additional stocking and cultural treatment. In other words, there is almost 20 million acres of Federal lands in the national forest system that are relatively unproductive and that should be made productive.

The interesting figures about air and oxygen supply that apply in this case relate to vigorous, fast-growing or good-growing forests. The research and investigations that have been going on show that 1 acre of good-growing timberland the trees take in the carbon dioxide from the air and that it is split in photosynthesis and with water it goes into the formation of wood and the release of oxygen.

One acre of healthy, vigorous, growing trees will release the oxygen requirements per year for about 18 people. So you can take 5 million acres, to just answer specifically your question, and multiply it by 18 and you would have the amount of oxygen put into the air that people would use.

So the oxygen requirements for 90 million people would result from reforesting and getting into a vigorous and healthy condition those 5 million acres.

Mr. Meeds. That is precisely what I was trying to get to.

I appreciate that. The chairman and I and a number of other members of this committee and of the Congress are cosponsoring legislation called the Youth Conservation Corps, which has as a goal a 90-day summer pilot project in taking youth from age 14 to 18 and putting them in the forests and on the public lands, Federal public lands of this Nation, to build trails, to plant and restock forests, and to practice against soil erosion and things like this.

Do you think that legislation like this could become a very important part of that 90-day experience? In other words, would we with this legislation perhaps have a work-study program capability?

Dr. Westell. Yes: I think so.

Mr. Meeds. I think you have been involved in a project very much like this in California?

Dr. Westell. That's right.

Mr. **Hodges.** I brought with us a description of that project in California. We would like to have the committee see this little brochure that explains it. We did appear and testify on behalf of the Youth Conservation Corps legislation.

Mr. **Meeds.** Mr. Hodges, do you think that we would assume that we were to develop some curriculums that particularly fits this outdoor experience and this work-study concept that we could under this legislation perhaps develop some good curriculums for Youth Conservation Corps, assuming we can pass that, which would aid in both areas?

Mr. **Hodges.** I am sure that it would.

Mr. **Meeds.** Thank you very much.

Mr. **Brademas.** I have one more question that I would like to ask you about, Dr. Westell. Yesterday Dr. Elvis Stahr, as you heard me say to Miss Henderson, suggested that the bill before us be amended to provide for the establishment of nature centers. I asked him later on to tell me what he had in mind.

Apparently he has in mind facilities and areas of land, maybe 50 acres, let's say, to which young people could go and, in effect, have an opportunity to see something of a world which they might not, especially if they lived in urban areas, otherwise have the chance to familiarize themselves.

Again I pretend no expertise in this field, but I should have thought that the assistance in providing leadership and maybe even some facilities for such nature centers might well be a way in which members of the Forest Industries Council could make a very significant contribution in the field of environmental education.

Would you have any comment on that?

Dr. **Westell.** There is no question about the contribution of the industry. I think the problem is that the forest industry is located in the forested areas. As I see it, the problem is in the urban centers. In some of the instances, I think I would compromise and ask for an acre or a half of an acre.

We could use the roofs of some of the buildings involved and start something in terms of agriculture and forestry to have this experience for the city people involved. This, in my judgment, is very vital.

Demonstration forests, or nature study areas, or dedicated areas for special uses of this kind are associated with every forest industry with which I am familiar in all parts of the United States. But their location isn't always the best.

Consequently, I think the problem would have to be attacked on the basis of what the specific needs are near the specific city. I would agree, yes, that urban people are deserving of this experience. I don't know necessarily that funds should be allowed or provided unilaterally for this type of thing without a great deal of supervision, because with the exception of Manhattan and some of the areas like that—and even there they have Central Park—most communities have parks that are easily adaptable to this type of study and experience, if the community wanted it.

Mr. **Meeds**. If I am not incorrect, I think one of your members, the Weyerhaeuser Timber Co., is contributing rather substantially to the establishment and operation of the 586-acre city on Whidby Island where they are building this ecological laboratory about which I spoke the other day.

Mr. **Brademas**. Thank you very much, indeed, Dr. Westell. Thank you very much, sir. We appreciate your testifying before us.

The subcommittee is adjourned. We will meet tomorrow morning in New York City.

Whereupon, at 10:50 a.m. the subcommittee adjourned, to reconvene on Saturday, April 11, 1970, in New York City.)

ENVIRONMENTAL QUALITY EDUCATION ACT

SATURDAY, APRIL 11, 1970

House of Representatives,
Select Subcommittee on Education
of the Committee on Education and Labor,
New York, N.Y.

The subcommittee met at 9:30 a.m., pursuant to recess, in room 305, Federal Building, 26 Federal Plaza, New York, N.Y., Hon. John Brademas (chairman of the subcommittee) presiding.

Present: Representatives Brademas, Scheuer, and Reid.

Staff members present: Maureen Orth, consultant; Arlene Horowitz, staff assistant.

Mr. Brademas. The Select Subcommittee on Education of the House of Representatives will come to order.

We are very pleased to be in New York City today for further consideration of the bill H.R. 14753, the Environmental Quality Education Act.

The purpose of the bill before us is to take into account the rising concern in the United States about the problem of the deterioration of our environment and the importance of educating Americans, particularly young Americans, about the entire spectrum of what have come to be known as ecological issues.

The bill before us would provide Federal funds for the purpose of developing teaching materials for use in the elementary and secondary schools and for community conferences on every aspect of environmental problems.

The funds could also be used for the support of pilot demonstration projects in the environmental education field, for training courses of all kinds, including the training of school teachers, to offer environmental education courses, grants for community conferences in which there could participate State and local governmental officials, civic and community, business and industrial leaders, as well as grants for the preparation and dissemination of materials on the environment suitable for use by the mass media.

The Chair is particularly pleased to be in New York City today surrounded on either hand by two of the most distinguished and effective members of this subcommittee and of the Committee on Education and Labor.

The gentleman from New York, Mr. Scheuer is one of the principal sponsors of the Environmental Education bill before us and has shown during his career in Congress a particular concern about the entire area of environmental quality and indeed was one of the delegates attending the recent UNESCO conference on the environment in San Francisco.

The other gentleman from New York, Mr. Reid, has likewise long been concerned not only with problems of the environment but with the problems in the field of education and has been a leading spokesman in the House of Representatives in his party for improving the quality of American education.

So the Chair, a simple country boy all the way from Indiana, is especially pleased to know that he has the support of two urban and sophisticated city dwellers from New York and would like to recognize Mr. Scheuer for an opening comment and then Mr. Reid before we call our first witness.

Mr. Scheuer?

Mr. SCHEUER. I want to thank the midwest and its presumably nonurbane Congressman, the Chairman of this subcommittee, for his kind words about us urbane, sophisticated New Yorkers.

Long ago I found out that urbanity, sophistication, and the highest quality of intellect and effectiveness are no monopoly of the eastern seaboard. Some of the most remarkably effective Congressmen who are also urbane and sophisticated do not come from the east or the west coasts at all, and Congressman Brademas, a former Rhodes scholar, is certainly very high on the list of those midwestern Congressmen who have distinguished records in their congressional tenure.

When Congressman Brademas and I first discussed the environmental bill with other members of the subcommittee last summer, I felt this was one of the bills that the subcommittee ought to take up because we were thinking of some other bills that have since come out of our committee, narcotics education, pre-school-child education and several others which ought to be developed but are mainly political.

But last July we felt this bill was right because the country needed its citizens' understanding of environmental problems. We felt that in order to get the enforcement legislation and conduct that would support our program, our feeling was, no matter how far ahead of the country we were, it was still the right thing to do.

And here we are 10 months later with an explosion of interest about the environment, with virtually all of the television and radio media deeply involved in environmental programs, with virtually all of our mass circulation magazines and newspapers having news sections on the environment and top editors in charge of stories on the environment.

So our country at this point in time is desperately trying to keep up with our constituency; namely, the American public and the media in their deep interest and concern.

I want to congratulate my subcommittee chairman for his total support of this bill and the thoughtful and highly intelligent way in which the subcommittee staff and he have put together these hearings. I believe that once the bill is passed, our country will benefit for 10, 20, and 30 years because the preschool child and the child in the elementary school will get a concept of the earth as a planet of limited resources that must look within itself and conserve and reuse. The child in elementary years today will be the voter a decade from now and the political and civic leaders two decades from now so I believe what we have to do now will have tremendous implications for the future. I want to thank my colleague, Mr. Brademas, for the tremendous support he has given this program.

Mr. BRADEMAS. Thank you, Mr. Scheuer.

The Chair wants to recognize another principal sponsor of this legislation, Mr. Reid of New York.

Mr. Reid. Thank you, Mr. Chairman.

I want to welcome you to New York City and thank you for the leadership you are giving us in this area. I would just like to say one or two things, gentlemen, because we are here to hear witnesses, not ourselves.

New York City probably has the worst air pollution in the country. We have major problems that are in some cases almost out of control in the environment, such as is the spread of pesticides including DDT into the deep oceans or other areas. My main point is fairly simple: I think our educational systems throughout the country need to include a great deal of work and training in ecological relationships.

It is equally true that in Washington until the advent of the Council on Environmental Quality at the White House level, there has been very little relationship or study between tanker oil spills, water pollution, thermal pollution, and air pollution. I think it essential to be sensitive to what the judge and jury are doing in relation to total pollution and ecological balance. If what will come out of the study of these relationships will establish some interdisciplinary work that will make it possible to identify the certain areas of interdependence, then I think it will be very meaningful.

Mr. Brademas. Thank you very much.

Our first witness this morning is Mr. John DeLury, president of the Sanitationmen's Association.

I will call on Mr. Scheuer at this point.

Mr. Scheuer. I want to thank Mr. DeLury for coming here today. Mr. DeLury is one of the men in New York City who have perhaps critical responsibility for our urban environment, how the city looks and feels, and how it relates to the individual.

He is a man of enormous responsibility. He is a man who works under tremendous pressure for the thousands of men whom he represents in the top policymaking activities in which he is engaged. I think it is an indication of his civic concern and tremendous involvement as a civic leader in every aspect of the welfare of New York City that he has chosen to come out here today.

So I want to thank him and welcome him and also thank the very impressive group of delegates from his union whom he has brought along to share the privilege of listening to him this morning.

So thank you very much, Mr. DeLury, for coming.

STATEMENT OF JOHN DeLURY, PRESIDENT, THE UNIFORMED SANITATIONMEN'S ASSOCIATION

Mr. DeLury. Thank you for your kind words, Jim.

Mr. Chairman, on behalf of the 10,500 members of the Uniformed Sanitationmen's Association, I strongly support H.R. 14753, and urge its immediate adoption.

It seems as if America is waking up to the damage being done everywhere—to the air, water, and soil. I hope that this new interest will be sustained—that it will not be a passing fad for the students, the media, and politicians. I am disturbed by the effort to find scapegoats, one-shot cures, and sure-shot gimmicks. But that won't clean up our physical environment. It will only add to the pollution in the air.

The faddists can always find another fad, but we sanitation men, the practical ecologists of the city streets, must stay with the almost impossible job of striving to keep the capital city of the world clean.

I have endorsed H.R. 14753 because it points to a crying need—the need to educate the people—and because it provides the money to educate in this specific area.

I have endorsed H.R. 14753 on the assumption that money for the required educational programs will be available in the first instance to the cities of our country.

The cities are where the people are.

The cities are where the air pollution is.

The cities are where the congestion, slums, rats, vermin, dirt and decay are.

New York, the city I know best, cannot now cope with the pollution of its streets and its garbage problem, in spite of its budgetary allocation.

Yes, additional funds for additional manpower and equipment are clearly necessary. And yet without an educated citizenry more money won't buy the needed results.

Our city is a polluted city. The pollution of our streets is a lasting impression with which vistors leave. Is this inevitable? Is it a necessary byproduct of our size density and congestion? Almost 8 million human beings live here. They occupy 742,582 residential dwellings. Daily they are joined by another 2 million people coming from the suburban bedrooms around the city to make their living here.

Two million automobiles find their way into Manhattan each day.

This population living, working, and consuming here, generate more than 10,000 tons of garbage a day. They abandon 60,000 cars on our streets which they no longer want. Our 6,000 miles of streets, are for many, their litter baskets and garbage cans.

How does the city cope? What does the administration do to prevent the people from choking on their own swill and being asphyxiated by the gas fumes of their own cars?

Three hundred fifty-three million dollars is the cost. That's the current annual budget for the Environmental Protection Administration. More than half that amount goes for sanitation services. That makes possible the daily employment of 14,000 people, of whom 10,500 are sanitation men. They are the men who go into the 6,000 miles of streets. They are the men who go to the doors of each of the 742,582 dwellings. They are the ones who collect the 10,000 tons of garbage a day and they clean the 12,000 curb-miles in the city.

They use 3,047 trucks of all types. The cost of this equipment is $60 million.

They dispose of this waste in eight huge incinerators, four landfills, and eight marine stations, using cranes, bulldozers, 40-yard trucks, conveyors, barges, and tugs whose costs exceed $30 million.

That's the city's effort. In addition, another 2,500 tons of garbage, waste, and construction debris collected privately are disposed of by the city each day.

The end is not in sight. Each year sees an escalation in waste generation of 9 percent. And this is the situation throughout the country. A leading business magazine recently estimated the cost of waste removal to be $5 billion a year nationally, with a cost increase of 20 percent a year. (Forbes magazine, Jan. 15, 1970, p. 18.)

Yes—more money is needed from all sources—local, State, and Federal. More capital equipment is required. But in addition, the people have a role; they can and have to help. H.R. 14753 can provide the means of educating people so they will help.

People, not some impersonal corporation, are the street litterers. People abandon their cars and scatter garbage on the city streets. If this pollution can be curbed at the source, then our city will be cleaner and the Nation's cities will be cleaner.

Education must begin in the schools with the kids. The adults must be reached through television, radio, and the press.

There must be booklets, cleanup drives, stay-clean drives. No one-shot gimmicks, but sustained effort and constant education are needed.

H.R. 14753 can mark the beginning of this education and reeducation until finally we develop pride of neighborhood and we see dignity in cleanliness.

One final thought. This type of education is also needed with those who supply our daily needs. Much has already been written about the responsibilities of the utility companies and the oil companies. I need not develop this point further. But our newspapers, a primary source of education, are ironically enough in the forefront of those who tax our public resources.

Take our Sunday papers in New York as an instance. The table which follows shows the cost of removing only two Sunday papers—the Times and the News. That costs the city a staggering $13,260,000—or 7.8 percent of our total sanitation budget.

I am not suggesting that the Times and News not publish Sunday editions. That would be like saying religion has to go. I am suggesting that those who contribute to the burdens should pay the costs, at least in part.

Mr. Chairman, there are no total answers. We must seek and find partial ones. Your bill is a partial answer with profound consequences. That's why I urge its passage.

If there is anything we can do, to insure that end, it will be done. [Applause.]

Mr. Brademas. Thank you, Mr. DeLury, for a most useful statement. I am particularly impressed by your characterization of the sanitation men as the practical ecologists of the city streets. It is a very telling phrase.

Let me ask you this question. What can you tell us about what kind of efforts are made in the city of New York to provide education in your elementary and secondary schools about pollution control, natural resources conservation and environmental problems, generally?

Mr. DeLury. Nothing at the present time. About 6 years ago, we had in the Department of Sanitation a unit of professional sanitationmen and officers to go into the school and talk to the children. That has been eliminated.

We had motion pictures to show the children in the schools. That's all gone by the board.

Nothing is being done.

Garbage was not important in this town, Mr. Chairman, until we had a strike in February 1968 and then all of a sudden everyone realized the impact of garbage on the community and from that time they have been getting to realize that sanitation is a primary function of the Department of Sanitation.

It may amaze you. Ten years ago we had 6,000 men who went out into the streets manually to sweep and clean the streets.

We have less than 400. Included in that 400 are those who operate the power broom.

Now a power mechanical broom in New York City is like me needing an additional head. You can't get to the curb to clean it because New York City is the largest garage in the world, parking on both sides of the street, double parking and triple parking. We can't clean it with mechanical equipment.

What we actually need—and I have been saying this again and again—is for men to be out mechanically with the broom and with that pushwagon we have to get in and clean it.

And another thing we used to do that no longer we do: Where it's a lot of heavy debris that you can't get it in and sweep it out, we used to hand-flush it, come with a hose and flush under it and force it out so we could get that.

All of these things have disappeared.

Mr. **Scheuer**. You can do the hand-flush under the parked cars?

Mr. **DeLury**. Yes, sir.

Mr. **Brademas**. I would hope, Mr. DeLury, at least in the light of the extraordinary amount of money that must be spent in a great city like this, that must be spent for removal of garbage and refuse, that at least in time one of the great values in the kind of environmental education program that we contemplate in this bill would be that you would reduce the cost to the city of collecting the garbage, because you would, as you have already suggested, educate the citizenry to practices that would be far less demanding on the city's resource.

Mr. **DeLury**. Mr. Chairman, it must get more expensive.

Although it is not within the scope of this subcommittee, our major problem is our union says 3 years—the city says 5 years—you are in a congressional district here—in San Francisco, Philadelphia, a year and a half or 2 years.

Where are we going to put it in 5 years?

I hear you saying 10, 20, 30 years ahead. We don't have the time.

Where are we going to put it, assuming we can collect it in the street, all the garbage that's vomited out? Where are we going to take it?

Put it to sea?

Mr. **Reid**. If the chairman would yield.

Mr. **DeLury**. Westchester has a problem, too, Mr. Congressman.

Mr. **Reid**. A kind of serious one.

I wanted to ask you about two specific suggestions ecologists are very interested in.

One is the recycling and utilization of certain material after processing such as is being done in Israel.

The other question I wanted to ask you is: What are the possibilities of compacting garbage with the new techniques? I gather you have even got a home compacting unit at this point.

I don't know the cost.

Mr. **DeLury**. I don't know the cost either. They have tried it throughout the world. The only place where I know they do anything with it is in Japan and they construct homes with the packages.

I know that part of your Department of Health, Education, and Welfare, I have met with them and they were suggesting that they compact it, take it out into the middle of the ocean and drop it.

But we are thinking of a total picture and thinking in time, and I am going with you, 10, 20, 30, 40, and 50 years.

The ocean is fillable.

There is only one way to destroy garbage and that's by proper incineration with high B.t.u. unit of heat that will completely dispose of it at 3,200°, 3,300°, 3,400° of heat.

All of these gimmicks I have heard since I have had the honor of representing this union, even to making wood alcohol out of the garbage, even to taking paper back and reclaiming paper, reprocessing paper.

It all failed, it all fell by the roadside.

Take all the abandoned cars. I am talking about 60,000 cars we took off the roads, off the streets of New York City last year, and next year it will be 80,000.

Mr. Reid. What suggestions do you have Mr. DeLury—because I think you made a very thoughtful statement here—to answer your own question of where do we put it? What new techniques were brought in which would be helpful?

Mr. DeLury. Modern incinerators such as they have in Scotland. I believe they have a plant in Germany, and this is only one way.

Mr. Reid. This is the high temperature?

Mr. DeLury. Right.

Now, you have a major problem there. There isn't a politician in New York City that is going to stand up to the pressures that's brought upon him by his local constituency when they say, "Let's put a site here."

Jim, up in Hunts Point when they wanted to put a marine disposal unit there or incinerator, the community rebelled.

Where are we going to put it? They will not allow it in any part of their areas and, politically people being as they are—and I can't blame them for it—they have to be reelected and they are not going to fly in the face of their local constituents.

This problem must be handled by Washington, the Federal Government because it is harder to get out a man that's elected by 50 States than a man that's elected in a local location like New York City, White Plains, or Westchester.

Mr. Reid. Of the amount of garbage you mentioned that you collect, 10,000 tons plus the 2,000 collected privately, how much of that is incinerated and how much of it has to be placed in some form of landfill or taken out to the ocean?

Mr. DeLury. 6,000 tons per day goes into the incinerator of which 2,000 to 2,500 tons reverts back to what we call residue, the unburnable, and taken to landfills or waterfront disposal places and taken out and dumped.

Sixty percent that's collected goes to the incinerator, of which 35 percent or more than reverts back to the landfills and the waterfront disposal places.

Mr. Brademas. I have no more questions. I recognize Mr. Scheuer.

Mr. Scheuer. John, I just want to say in reference to your comment about Hunts Point that I won't represent the Hunts Point area until this January 1. I expect to be——

Mr. DeLury. Being a crusading Congressman, I expected you would be concerned in the whole Borough of the Bronx.

Mr. Scheuer. Of course I am, but Hunts Point won't be in my constituency until next January. I expect to be elected in November.

I will make a pledge to you from the point of view of the overall master city planning concerning this city. If Hunts Point has the right to put in an incinerator I will cooperate with you and the city planning commission and the city board of estimate and city council in the consideration and the planning of a complex with perhaps some other services to sweeten up the pie, that that community will want it; I will design a package of facilities and services that will be a plus for that community.

That's good practical politics and good long-term planning combined. There is no reason why with modern technology an incineration plant can't be designed that is attractive, that is clean, that is an asset to the neighborhood and that can combine wih some of that open space facilities and services in terms of recreation and entertainment, culture, health services, job training programs and the like, so that the whole package will be a definite positive plus for that neighborhood. I will make the pledge that I will sit down with you any time now and develop such a plan and will go down to the city hall to talk about it starting tomorrow morning.

There is no reason why a practical politician like myself and an enlightened civic and union leader like you can't put together a package that that neighborhood will accept.

Mr. DeLury. I agree with you.

Mr. Brademas. You have just seen a treaty signed.

Mr. Scheuer. Let me just ask you one more question.

We are trying to develop through this Environmental Education Act public support for measures that will give you and your men the capability to do the job that we want to do and that you want to do.

Now, you have described a few things that you would like to do and we hope that with our education program you are going to have the public support that will put the heat on the city legislature and the mayor to give you what you want to do the job.

You want more men to do the job manually. You want to be able to do the manual hosing.

What are some of the things you would like to do if you had the public support of the Board of estimate and the council and the mayor's office, if you could write your own ticket?

Mr. DeLury. One of the things I would like to have is units that go out from the Department of Sanitation to the schools and talk.

I would like to have films that show the picture what it's all about, like we have here [indicating].

I would like to do all of these things. But unfortunately every time the union opens its mouth, all they think we have is an ulterior purpose behind our suggestions.

I know. I live in New York City. I don't cross a bridge every day to get to New York. I live in New York City.

I am proud of the city. I want to be prouder. I want it to be a clean city.

Mr. Scheuer. John, why were those education programs stopped that you designed?

Mr. DeLury. Well, they claimed for economic reasons.

Mr. Scheuer. It seems to me that in this case economy may have been the last refuge of a scoundrel. If we don't teach our kids in the school to respect their environment and their block and their hallways and buildings, what hope is there that your men are going to be able to catch up with the public's and industry's slothfulness.

Mr. DeLury. We are not going to be able to catch up unless we get at the source at the school.

Mr. Scheuer. One other thing. In addition to being a sponsor of this bill, I am a sponsor of two other measures that I think you will be interested in.

One is a measure that returns us to the return deposit bottle. That was a great recycling system that man devised. My bill, by placing a heavy tax on the non-deposit bottle, would put the youths in the business of getting those bottles and tin cans off the street, and thus making the job easier for you.

The second bill that I have sponsored—and let me say dozens of my colleagues, including Congressmen Reid and Brademas, are cosponsoring—is an abandoned automobile act that places a $30 deposit on that abandoned car which goes all the way through to the last owner. The last guy gets his 30 bucks and breathes a sigh by delivering that car to the junk dealer.

So you won't be faced with those 30,000 abandoned cars on the streets of New York City. It provides an economic incentive to get that car into the recycling process.

Mr. DeLury. They are all good suggestions. I don't want to take a difference of opinion of you.

The returnable bottle, if there is a fee on it, the kids are going to dig into the garbage can and get it.

I say there should be a tax on these people, like I say the News and the Times. The end product should have a tax on it so we could really get on to the problem.

Mr. Scheuer. Yes. An engineer has proposed that all wrapping products have a tax of 1 cent a pound and all products that have a life of 10 years have a tax of 1 cent a pound.

That would mean tens of millions of dollars a year that would be returned to the city. You pay a tax of 30 bucks a car; on a television set that weighed a hundred pounds, you would pay a tax of a dollar; on a chewing gum wrapper you would pay a tax of a cent; and that money would go back to the cities to pay for more men and more sophisticated equipment to do the job.

So apparently that idea of yours has gotten into the stream of commerce and has gotten some consideration.

Mr. DeLury. Thank you.

Mr. Brademas. Mr. Reid?

Mr. Reid. One point I would like to get into and pursue a little further is: What experience did the uniformed sanitationmen have with the programs in the schools?

What was the reaction?

What kind of materials seemed to be listened to and be effective?

Mr. DeLury. They just went in, they went around and they looked for sanitationmen that spoke many languages.

We have a language in certain parts of the city that's Spanish. We had our boys here, they were schooled, went out and they talked just about the city's streets and what it meant to them.

They gave the picture of what happened to the streets that are listed, like rats, and it was very, very constructive.

And our city streets didn't show the lack of that, until we lost that, until the last five or six years the plague in New York, in the dirty streets, has increased and escalated.

Mr. Reid. Can you see the relationship between this program going on and cleaner streets and less litter?

Mr. DeLury. No question.

Mr. Reid. Do you have a suggestion as to the kind of material? I think the suggestion you just made, that in New York some of it be in Spanish, is very important.

But in addition this bill will deal not alone with garbage and polluting the atmosphere, but with the whole relationship and ecological balance.

Mr. DeLury. Right.

Mr. Reid. My impression—and I would be interested in knowing yours—is that increasingly in schools there is interest in every aspect of the environment and, if we don't do something pretty soon, we will pollute ourselves off this planet, and I think almost everything in this field now has great interest, fortunately.

Mr. DeLury. I agree with you. Let me say, on April 22, Earth Day, I am glad the students and college and university kids are coming out and making an issue out of it, because that will brush down to the high schools and elementary schools, because when the youth moves, maybe Washington will move and Albany and maybe city hall will move.

I hate to do things under duress or crisis. We can put ourselves ahead of it. Let's face the problem.

I only hope, fellows, that when you go back to Washington after this meeting you don't take the facts that you have heard here this morning and file them in the famous archives of Washington, and that you do something about it.

Mr. Reid. Well, I can't predict what the House will do but I can comment that I think there is a reasonable likelihood that the bill will move, at least in the subcommittee and quite probably in the House, and I have not seen any environmental bills that have not enjoyed enthusiastic support and you can be assured we will get to it.

Mr. Brademas. Thank you very much, Mr. DeLury, for your support.

Our next witness is Mr. J. G. Harrar, president of the Rockefeller Foundation. Mr. Harrar, we are very pleased to have you with us this morning. Please proceed.

STATEMENT OF J. G. HARRAR, PRESIDENT OF THE ROCKEFELLER FOUNDATION

Mr. Harrar. Thank you very much, Mr. Chairman.

I would prefer not to repeat what I have said in my prepared testimony but I could perhaps for a few moments extend those remarks.

Over the substantial number of years that I have been involved with environmental science, I have tended to believe that analogies can be drawn between the problems of environment and problems of health.

We are prone too often to overlook the possibilities of preventive medicine. We do not take advantage of available medical knowledge as soon as possible after the first symptoms and signs in order to prevent disease.

I think in society we have the same situation. We have had many signs, many symptoms of deterioration of our environment, not beginning in 1969, or even in 1968, but for several decades at least.

These have been noted by small groups of individuals—zealous people who felt very strongly about the quality of our environment have cried out, often in the wilderness, have tried to get our society to do something, to undertake a social checkup to determine what ought to be done.

What has happened to our water recently, to our soils, to our air envelope, are only symptoms, but remedial action now can make all the difference between the quality of the sort of life we would like to have and that which we have been forced to accept.

Now I think we have reached the stage of pathology in our environment. It is sick, diseased. We have been accustomed to looking at our environment as we do at the weather: we are all bothered by it, but think we can do nothing. Now, at long last we are finally going to try to do something about it.

I worry a great deal about the fact that we have taken so many irreversible actions. We have gone down some paths that will be impossible to retrace. And the damage done will be very difficult, very expensive, and perhaps impossible to correct.

Maybe in some situations we can only try to patch up and save what is salvageable.

Surely we cannot return to the time years ago when we viewed our national resources as something to be had for the taking. I think that that view will never again be possible. And certainly, if you saddle the next generations with this burden, they may never experience what we were able to experience in our youth.

As you will recall, the Bible has a quotation that says that man has dominion over the land and sea and all the earth.

I think that what has happened is that we have taken this literally rather than responsibly.

In the last instance, man, because of his intelligence, does have this dominion but he also has a grave responsibility to utilize this dominion in such a way as to make the best better, to improve what is here already, to improve what is available to us, and to preserve and protect our resources for those who come after us.

This is one of the reasons why I feel so strongly that the bill here being considered is of extraordinary importance.

I think we would be unwise, however, if we limited our thinking to our own country, because we are now part of growing disasters on a global scale.

The environmental degradation going on is not unique to the United States, Smog covers not only the eastern and western seaboards and parts in between but Mexico has an extraordinarily highly developed smog phenomenon; the Ruhr Valley in Germany, Milan—I have recently returned from Milan and the plane was delayed because of the smog.

This situation is not something that we can consider as being uniquely American. It is uniquely human in that we tend to destroy all too often whatever we touch. We take advantage of what we touch, and we destroy the long-range development of the globe on which we live.

I congratulate you and all of your colleagues, for drawing up this bill. You had the initiative and enterprise, imagination, and creativity to realize the only way we can get at the viscera, shall I say, of this problem is to get at our young people who will be the decisionmakers of the future. They will be not only voters, but decisionmakers and civic leaders, and will determine the nature of the envorinment as the years go on.

I would hope that, as funds become available for research, there be funds available also for the training of people who are going to carry on programs—those who are going to teach others, to teach teachers to teach youngsters. Again using the medical analogy, I would hope also, that you would think of internships so that more and more people would be exposed right out in the field to the problems that are being confronted so that we can get a combination of practice along with theory, because taken alone neither is sufficient.

I think that, if this bill is enacted its success will be a measure—a real base line—of what can be done in this country and in other countries.

We have limitations, but one of the ways our Nation can be helpful to others is to show how we clean ourselves up through control of ecological activities.

The most affluent societies are always the most destructive societies in terms of their environment. If we have the ways and means, the technology and the money, we exploit our resources at a much more rapid rate than other less developed countries around the world.

I come down to the final point I would like to make. We have reached the point where there is a concern over the pathology of the environmental situation, and a recognition of the absolute necessity of bringing about a system of communication that has never been developed in this country before.

I think every citizen, no matter what his background, his economic or social level, if given the opportunity, can use his role as a responsible citizen of America and of the world to work individually and collectively to reverse the direction of this threat.

I believe your bill, if it is enacted, would be an important factor in bringing about this change.

Mr. BRADEMAS. Thank you very much, Mr. Harrar. I think it is a most enlightening statement and I would like to ask that we follow the procedure with your statement in the hearings.

(The prepared statement of J. G. Harrar follows:)

STATEMENT OF J. G. HARRAR, PRESIDENT, ROCKEFELLER FOUNDATION

My name is J. George Harrar and I am president of The Rockefeller Foundation. My professional education and experience have been principally in the area of science—in particular, in biology.

The legislation—bill H.R. 14753—being deliberated here today would in my opinion contribute significantly toward a better understanding of our ecological crisis and toward educating the public as to the importance of environmental responsibility..

Environmental damage has been going on for years, but it is only recently that its rate has become so accelerated and its effects so widespread as to create a general concern and growing awareness that we are face to face with an ecological crisis. More and more people now recognize the need for immediate measures to arrest the palpable threat to the quality of life and realize that there is no single-formula soution to the problem. Numerous individuals and groups in both public and private life are currently attempting, each in their own way and in their own specialized fields, to cope with, or at least to push back to some degree, the impending crisis. Municipal authorities, scientists, doctors, technicians, state and federal legislators, city planners, university faculties and students, philanthropists, and corporations are increasingly involved in finding ways to prevent the further impairment of our environment, to slow down its rate of deterioration, or to repair the damage done thus far.

I, and I am sure many others are particularly gratified by those sections of the proposed "Environmental Quality Education Act" that seek to establish and encourage education and information programs that will lead to a better understanding on the part of everyone—teachers, students, and other citizens—of man's place and responsibility within that totally interrelated scheme of things that we call nature. We have come to realize all too slowly that man despite his extraordinary technological triumphs is and always will be dependent upon his physical environment—the earth, air, and water that is his home.

At this critical juncture, when we are finally coming to realize the hazards and dangers of our situation, it would be well for man to question the validity of his attitudes towards nature and to consider seriously the desirability and wisdom of formulating a new ethic for dealing with his natural environment which would transcend most of the values we have traditionally held concerning our world.

The Bible tells us that God gave man dominion over all the earth and over every living creature on it. Man has misinterpreted this injunction as a license to exploit rather than a conferral of responsibility. In the last analysis, man does indeed have dominion over all the earth, but this puts him under grave obligations. Morally, no society has the right to over-utilize the world's resources for its own contemporary and selfish interests. Man must understand biological systems and conduct his affairs in such ways as to improve the quality of life rather than degrade it through wanton exploitation.

It is admirable and public-spirited to be deeply committed to the well-being of the present generation of human beings who here and now inhabit the earth, and hopefully this attitude will grow and continue. It is even more commendable for men living today to become increasingly concerned about the future of their children and their children's children in the face of a worsening environment. But the new ethic of ecological responsibility must extend far beyond even this highly humanitarian concern. It must embody the highest responsibility of all—the ultimate responsibility for the total natural environment, the biosphere, and life itself—not human life only, but *all life*, in its varied and diverse forms.

The first principle of the new ethic would be that man must control his own fertility. Whether we are concerned primarily, with the present population of the world, with future generations, with man's survival as a species, or with preserving the stability of the entire biosphere, it is absolutely imperative that the human birth rate be curtailed. Man's superior intelligence and his belief in the intrinsic worth of each human being do not entitle him to assume that the natural environment should be given over to the production and maintenance of his own kind. Instead, it would be incumbent upon him, as the only species capable of making moral decisions, to live up to his total responsibilites and move toward a goal of zero rate of population increase.

The new ethic would also reject the premise that technology alone can provide answers to all or most of our environmental problems. It is true that technology has been a major and constructive force in the development of our society, and is using its inventiveness today to provide new methods of cleaning up after itself, of controlling pollution at its source, and of re-using the residuals being produced by our present industrial system. But technology does have its limitations. Advanced technology has a tendency to create the need for even more technology and often merely substitutes one kind of pollution for another.

It is easy to blame technology for many of our environmental ills, but it must be remembered that technological advances are often in direct response to public demand. The entire society has the responsiblity of recognizing what we are doing to our environment and of making individual and collective efforts to reverse the negative effects of certain forms of technology. We are prone to overvalue the production of nonessential material goods which rapidly become obsolescent and are eventually consigned to the already tremendous body of accumulated waste that is piling up around us. We must, of necessity, adopt self-imposed restraints by which the individual voluntarily refrains from contributing further to our ecological imbalance and is ever conscious of the need to conserve and not to destroy. Only when increasing numbers of individuals, groups, and communities recognize and accept their responsibilities and take organized action can improvement occur. Today, in this country, we have more than 200 million people, all contributing in some measure to the degradation of their environment. When these individuals can be persuaded to embrace the new ethic, to become "conservers" in the best sense of the word, a major victory will have been won.

The third principle of the ethic of responsibility for the environment is that we, in the more advanced nations at least, should put considerably less emphasis on that form of economic growth that simply multiplies production and consumption of material goods. We dwell in a finite world where many changes and processes are irreversible. Our resources are not limitless, and when those that are nonrenewable are consumed or transformed, they can never be replenished. Our present resources should be carefully husbanded and conserved. With stabilized populations, more attention and resources could and should be devoted to services and to those areas of life that enrich the quality of human existence: cultural activities, the arts, literature, intellectual and scientific pursuits, aesthetic improvements, and human relationships.

A final basic principle is that man should consider the equilibrium of the natural environment before initiating any actions that would disturb existing ecosystems. Modern technology, urban expansion, and rapid industrialization have drastically altered the ecological balance in many localities, extinguishing certain plant life and animal species. Complex genetic material, once destroyed, cannot be recreated in a laboratory. Not only will the natural environment be altered and impoverished; it will become a much less varied, interesting, and desirable place for man to live.

The proposed legislation, if enacted, could, in my opinion, be of great value in bringing Americans of all ages and all educational levels to a recognition of the urgancy of the problem and to an understanding of their responsibilities in maintaining and enhancing environmental quality.

Mr. BRADEMAS. I was particularly impressed by your recitation in the prepared statement of the several principles of what you call the ethic responsibility for the environment, and I take it it would be your hope that at least one of the principal values of the kind of bill we are considering would be to help teach young people in particular these principles of an ethic of responsibility for the environment.

Mr. HARRAR. I do indeed, sir. I think this would be perhaps the greatest single benefit that your bill, if it is enacted, can bring to our nation.

Mr. BRADEMAS. What can you tell us, Mr. Harrar, about what the Rockefeller Foundation is now doing and indeed other foundations, if you wish, in the field of environmental studies?

Mr. HARRAR. Well, we have now for a number of years been working in a wide variety of activities in this field.

Concerning the matter of DDT which was mentioned this morning: It was known when it was first introduced that DDT was a broad spectrum insecticide. And when you look back at what DDT has done in terms of control of typhus—particularly in war-ravaged areas—and of pests and pathogens of our crops and animals, you realize that it has had an enormous beneficial effect.

In the early days, it was also economically advantageous, since it was cheap, easy to apply, and very effective. But we now realize much to our sorrow, its degree of persistence in the environment. This is one of the problems we face.

We have been working for some time to try to find analogs or other forms of pesticides because, if we should suddenly stop using all forms of pesticide, we would immediately begin to have food shortages the same year.

We will have to find pesticides which will be more narrowly focused against single pests, which do not enter the soils and which are biodegradable.

We are also working on biological ways of controlling insect pests—some of the tricky ones where you sterilize the males and turn them loose on the unsuspecting females in the population. In addition, we are working on the pheromones, which are the sex-attracting hormones.

Mr. Reid. Did you say pheromone?

Mr. Harrar. Pheromone, p-h-e-r-o-m-o-n-e. Those are the sex attractants. Used in very, very minute quantities they attract the opposite sex, sort of entice them to their destruction, without utilizing poisonous substances.

Mr. Reid. Thank you.

Mr. Harrar. We are also very much involved in the training of people in the field of environmental science.

We have supported work at many of our leading universities, the University of Michigan being one of the outstanding, and recently at Michigan State University as well. These and other universities will be after you very hard if your bill goes through, because this is the kind of money they need to develop programs in graduate training in the fields of ecological environment training. These are the kinds of facilities which I assume, with the financial resources to back up your bill, could be very well utilized in getting across an ecological understanding to the Nation.

Mr. Brademas. I should state, Mr. Harrar, it is not the principal purpose of the bill to support studies at the undergraduate or graduate level in universities. But there are clearly roles for institutions of higher education in the bill in helping to develop teacher materials and conducting assessments of projects of teaching environmental studies.

But I think it is fair to say that the principal focus of the bill would be on supporting environmental studies at the elementary and secondary school level and in adult education and community conference type education.

I am sure you are aware of the report prepared by Dr. John Steinhart and a White House summer fellow, published a few months ago, aimed at the particular problem to which you just addressed yourself, namely providing encouragement for graduate and undergraduate studies in environmental education.

I think I read the other day—and this is my final question—that the Rockefeller Foundation had embarked on some new enterprise in environmental education or in the environmental field.

Am I mistaken in that?

Mr. Harrar. I would say we should not use the word "new." It is a somewhat different orientation which has been introduced into a program we built up over the years.

For example, one of the most recent ones is working on a report of the studies of residuals and the recycling and reconstitution of the materials which must be taken care of, as Mr. DeLury said, in the years ahead.

This perhaps forms the new thrust you are speaking of.

I think I read into your bill support of research because I wanted to. I think we have to have some support of research to produce the information to do this.

Mr. SCHEUER. We wanted you to.

Mr. BRADEMAS. Thank you.

Mr. SCHEUER. I want to thank you very much for your testimony. It was very generous of you to come here on a Saturday.

I don't want to repeat the questions Congressman Brademas asked. I want to ask just one question.

You mentioned pollution in the Ruhr District and in Milan. Congressman Reid mentioned pollution in Israel. All of these have international implications. They cross boundaries.

The Israelis have done a lot about the air pollution of the oil refinery in Haifa, because, when the wind blows right, which occurs most of the time, it blows 3 miles away to the Lebanese, and air pollution becomes a Lebanese problem.

Water pollution, I don't have to tell you, crosses many international boundaries.

What do you think ought to be done in terms of education, maybe education of Congressmen and Cabinet Ministers, to get some kind of international pollution action in terms of controls and programs that will restrict international polluters, the large industrial polluters of both air and water that cross national boundaries?

Mr. HARRAR. I have written and spoken on this subject without any visible effect up to now, I think.

I have just participated in a meeting at which I stated, among other things, that I would hope the United Nations might consider it vitally important to have one of its components, such as the World Health Organization or a new agency, deal with this problem. Is there not a place in the U.N. for an entity devoted to world environmental problems, supported by all the nations, and with international leadership and personnel?

Secondly, I think we should have an international consortium, joined by all the nations that are concerned with environmental problems, which would find ways to increase control and correct abuses.

Mr. SCHEUER. Thank you.

Mr. BRADEMAS. Congressman Reid?

Mr. REID. Thank you very much, Doctor, for your prepared statement which I read very carefully and for your eloquent discussion of these problems.

One of the things that intrigued me is, if you are talking about thermal pollution, you are dealing with the AEC, you have their interest in it because they sometimes promote reactors.

They tend in their analysis and approach to say, "Everything we are doing is all right," and more than that to downgrade the scientific credentials of someone else who may have a somewhat different view.

For example, they do not seem to me to take cognizance as much as they might of the genetic or indeed the environmental effects, whether you are talking about change in temperature of water by a few degrees or what may happen genetically through the use of tridium.

It is very clear to me there is a certain defensive tendency among those who have been responsible for certain of these programs, whether it is the Department of Agriculture in pesticide or the AEC in atomic plants, in trying to prove the standards they have set are adequate.

My question is a simple one. How can we get the various scientific disciplines to identify certain basic common factors, first, as to how much radiation there is or what we are the genetic dangers of a given element, and agree on the factual case and then get to the question of the premises, the standards, the international relationships, the biological magnification?

What the AEC may say is a tolerable standard is not necessarily a tolerable standard if the fish magnifies a hundred times going up the life span.

If the various disciplines could get together and work on common standards, rather than trying to blast one another for not being knowledgeable in physics, when perhaps the physicist isn't knowledgeable in phonetics——

Mr. HARRAR. I think—and I say this with a certain amount of trepidation—some progress is being made in this direction.

I recognize that what you said has been the pattern of the past.

Someone will say "the people in this area just have to have more power," so we have to put up a dam, cover land, cover this, and destroy that. It is an economic emergency.

As you say, the fish are not being consulted; the sportman is not being consulted, the wildlife is not being consulted. They have no choice other than to get out of the area.

A lot of progress is being made, I think, at the top levels of science. It is just my own observation, but I believe this is one of the reasons for the creation of a National Academy of Sciences committee to recognize problems in this area.

The Academy has diligently, I believe, tried to find ways to bring together the various points of view which should be given consideration and respect.

I may be wrong, but I do not feel progress in the direction you are talking about and which you and I would like to see take place is yet in full scale forward movement.

As you know, at present there are two proposals before various bodies for the establishment of interdisciplinary institutes of environmental science. One will be international, the other national. The National Academy of Sciences is involved, as are various groups of scientists, the President's Science Advisory Committee, conservation groups, and so on.

This is a creative idea that is slowly moving in what I think is the right direction.

Mr. REID. Should something like that be funded at the national level?

Mr. HARRAR. As the proposal now stands—it would be set up with private resources so that it would have the freedom and flexibility to organize itself and then, hopefully, be useful enough to attract public funds and then because of its excellence and quality to expand and extend its activities.

Mr. REID. One of the problems, for example, that disturbs me now is the SST, because I am told by those knowledgeable that we will be placing particulate matter above the biosphere where the atmosphere no longer has the ability to purge itself. Yet we are going ahead on this at full steam without any efforts to protect the protective shell around the earth.

Might I ask you whether you are at all satisfied with existing AEC standards, such as they are, for either thermal pollution or radiological dangers, including the genetic thing?

Those are two general questions.

Mr. Harrar. May I disqualify myself as a physicist, which I am not. I can only speak as a citizen. But I believe we have to extrapolate, project, and try to simulate all the variables in models.

We now utilize computer banks, as you know, perhaps we could use multiple computer bank arrangements, to predict what would happen to polar ice caps; I wish we could do a lot more of this simulation, using the most sophisticated hardware we have, to determine what we are doing in terms of the unbalanced environment, whether it be in the lower part of the atmosphere or higher.

I do not think the answer will be soon forthcoming. The question is what we are going to do in the interim.

Mr. Reid. Thank you very much.

Mr. Brademas. Thank you very much, Dr. Harrar.

I just want to observe on your colloquy with Mr. Reid on the matter of computers, we have had testimony earlier this week from Dr. Margaret Mead and Dr. John Cantlon, both of whom echoed your hope that simulated variables could be used to help harness the computer to tell us what the impact of a wide variety of changes would be on the ecology and I am very pleased to hear you indicate you have been thinking in the same way.

Your testimony has been most helpful to us, Dr. Harrar, and we thank you for having come.

Mr. Harrar. Thank you very much.

Mr. Reid. Thank you.

Mr. Brademas. The Chair recognizes Congressman Scheuer to present our next witness.

Mr. Scheuer. It is a great pleasure for me to recognize perhaps the Nation's most distinguished environmental lawyer, David Sive. I want particularly to welcome Walter and Teddy Sive who have accompanied their dad and constitute, I know, his real brain trust.

I would ask for your unanimous consent for an article by Mr. Sive, entitled "The Law and the Land," to be printed in its entirety before his oral testimony.

Mr. Brademas. Without objection, it will be included.

(The article mentioned above follows:)

The Law and the Land

(By David Sive)

Every great social movement turns to the courts as well as to the legislatures. In the decade just ended, our courts—at times as much as and perhaps more than our legislatures—led in the evolution of the particulars of meaningful civil rights and racial equality. The executive and legislative declarations of war on poverty were quickly followed by the birth and rapid growth of a field of law unknown in the preceding decade—"poverty law."

Now the environmental crisis has spurred the great new political and social movement of the 70's. The liveable environment movement will be the man of which the child called the conservation movement is the father. It has begun to move into the courts and create a new body of law, the name and identity of which has been established within the last twelve months—*environmental law*.

Consequently, there are some important and obvious questions which merit examination outside the traditional law journals. For example, what role will be played in the development of this new body of law by the individual citizen and the citizens' groups representing the numerically overwhelming and, hopefully, not-too-silent majority? What special problems must be met? What novel issues must be litigated so that new doctrines of environmental law can develop? What is the relationship of the litigation process to the political process?

Environmental law is essentially the law prescribing the respective rights of two classes of contestants in our lands, waters, and air. The identity of one contestant seldom varies; it is the general public opposing a particular disposition of resources—the citizens of a city or village to be bisected by a road, of a river valley to have its crowning scenic glory cut away, or of a whole nation fearing a Silent Spring. The identity of the second contestant varies according to the nature of the proposed disposition. It may be a utility or manufacturing company seeking a license from a government agency. It may be the government agency itself.

In the cases in which the respective claims to and rights in resources have been litigated, the representative of the general public has most often been either an *ad hoc* citizens' group, formed for the purpose of the particular contest, or one or more of the major national or regional conservation organizations, foremost of which have been the Sierra Club and the National Audubon Society.

The contest is substantially unequal. The corporation or government agency has virtually unlimited resources of money and all that money can buy—lawyers, expert witnesses, printing, models, charts and other exhibits, and all of the multitudinous goods and services that go into a major lawsuit. The conservationist group must recruit and organize largely from volunteers. It must appropriate from a deficit budget or conduct house-to-house campaigns to raise small sums from large numbers of people. This latter process, involving the use of neighborhood committees and all the other accepted techniques, is not essentially different from fund raising for construction of a new hospital or church wing.

Funds are needed for expert witnesses in cases in which the services cannot be secured free. If the hearing or trial is any considerable distance from the residence or office of such witnesses, travel expenses mount quickly. The fact that the witness may be required to testify on a date not chosen by him, but chosen by the court or administrative agency before which he testifies, may also prevent rendition of services wholly without compensation.

The attorneys representing the conservation organization must be willing and able to contribute most or all of their time and skills to the litigation. Of all the significant cases thus far brought, some of which are still pending, in none—to the knowledge of this writer—have the attorneys received more than a small fraction of their fair compensation. In cases in which the issues are exclusively legal, with no important factual issues to be tried, the task is generally manageable. This is because the work schedule is controlled by the attorney. He may devote evenings or weekends or daytime hours when other matters are at a lull. In cases in which issues of fact are to be tried, there is no way for the attorney to avoid the out-of-pocket loss of fees on commercial matters which he must turn away. Therefore, it becomes impossible for the conservation organization's attorneys to serve completely without compensation.

Several factors aid the conservationists. The recruitment of expert witnesses who may testify for little or no compensation is aided by the fact that universities and university towns are always conservationists' strongholds. The sudden and explosive involvement of students in our environmental crisis—to be climaxed by the April "teach-ins"—is providing a fund of skilled and dedicated researchers, field investigators, proof readers, typists, and messengers.

The environmental revolution is now sweeping the law schools. Many have highly organized environmental law societies. Since much of the inequality of the conservationists' lawyer versus his corporate or government adversary is in the availability of young associates to do the long hours of legal research, law students, if organized, can be of great help. A good second- or third-year law student is almost equal in legal research to a young practicing attorney.

What are the problems of the conservationists in court other than the basic inequality of financial resources? One is the sheer novelty of some of the issues to be tried before the courts or administrative agencies. In an increasing number of cases, starting with that of the proposed Consolidated Edison power plant at Storm King Mountain (the Scenic Hudson case), the issue is beauty versus utility. The two must be weighed under a legal formula provided by a statute or a court ruling which provides that the protection of natural beauty is to be given due consideration.

In the Scenic Hudson case, the basic statutory formula is in the Federal Power Act governing the grant or denial of the application which requires that the project:

> "be such as in the judgment of the commission will be best adapted to a comprehensive plan for improving or developing a waterway or waterways for the use or benefit of interstate or foreign commerce, for the improvement and utilization of water power development, and for other beneficial public uses, including recreational purposes. . . ."

The place of beauty in a "comprehensive plan" was stated in a now-historical sentence in the opinion of the Court of Appeals which reversed the original grant of a license to construct the Storm King Project. After pointing out the errors of the Commission in its granting the license to Consolidated Edison, and requiring new proceedings in order to receive additional evidence, the Court described the fundamental questions which the renewed hearings were to examine. They must, it said:

> "include as a basic concern the preservation of natural beauty and of national historic shrines, keeping in mind that, in our affluent society, the cost of a project is only one of several factors to be considered."

The intervenors opposed to the Project, primarily the Scenic Hudson Preservation Conference and the Sierra Club, relied upon this statement of principle of the beginning of the adoption of a different philosophy in our developing law of natural resources. Thoreau phrased it this way a century ago:

Most of the luxuries and many of the so-called comforts of life, are not only not indispensable, but positive hindrances to the elevation of mankind.

While the society of Thoreau was not "affluent," ours certainly is, at least in that by applying to our social and economic organization some small fraction of the intelligence we apply to going to the moon, we can provide every person with all the necessities and some of the comforts of life.

Beyond those necessities and "necessary" comforts, we must make a choice of goals, and perhaps the choice should at least sometimes be to elevate, rather than fatten, mankind. Scenic Hudson and the Sierra Club have interpreted the mandate of the Court of Appeals to require a sophisticated analysis of the nature and degrees of scenic beauty. Their position has been that scenic beauty can be objectively analyzed, and degrees of beauty stated.

Both Scenic Hudson and the Sierra Club did analyze the degree of beauty. They produced testimony of several experts on scenic beauty, including Professor Charles W. Eliot, II, of Harvard; Charles Callison, Executive Vice President of the National Adubon Society; Professor Vincent Scully (History of Art), of Yale; and David Brower, Executive Director of the Sierra Club. All of them testified that Storm King and the Hudson at Storm King were not simply places of scenic beauty, but the supreme river scenery in eastern United States.

Mr. Callison called the Hudson at Storm King "the most beautiful stretch of river scenery in the United States." Professor Scully's description was perhaps the most lyrical. He described Storm King Mountain as follows:

It rises like a brown bear out of the river, a dome of living granite, swelling with animal power. It is not picturesque in the softer sense of the word but awesome, a primitive bodiment of the energies of the earth. It makes the character of wild nature physically visible in monumental form. As such it strongly reminds me of some of the natural formations which mark sacred sites in Greece and signal the presence of the Gods. . . .

Each of the several experts classified the Hudson at Storm King as equal in scenic beauty and magnificence to many of our national parks.

The beauty of the mountain and the surrounding area has not been seriously disputed by the Company, although Con Edison has not accepted the conservationists' analysis of degrees of scenic beauty. The Company's principal point has been that the project would not mar the beauty of the mountain, because from most angles at most seasons of the year it would not be seen. The issue of the precise visibility of the project works was the subject of many hundreds of pages of conflicting testimony.

The claims of Scenic Hudson and the Sierra Club, that the construction of the project and of the attendant facilities would seriously damage the value of the mountain and the surrounding area as objects of natural beauty, are not based solely, however, upon the degree of visibility of the project works. They have raised an issue of the effect of the project upon the integrity of the mountain itself. This point, the "integrity of the mountain," was made in the testimony of another of the Sierra Club witnesses, Richard Pough. His point, essentially, was that the ultimate value of scenic beauty is its impression on and in the minds of the persons who perceive it.

Even though much of the project works may be camouflaged by paint, plantings, artificially roughened rock, and other devices, if those who perceive the mountain and the surrounding area understand that the mountain is subordinated to the project, the end result is appreciation and admiration of engineering works, and not of the works of the Creator of the mountain.

The point is summarized in the following extract from the Sierra Club's principal brief:

"It is this character and 'integrity of the Mountain' and the surrounding areas that must be borne in mind in determining the extent to which the Project, and all that goes with it, will mar the natural beauty of Storm King and its environment. If its meaning is changed, in the eyes of those who behold it, its supreme value as a preserver and embodiment of the spirit of . . . New York . . . to a whole nation, particularly the vast millions in its greatest metropolitan area, is forever lost. In that event, no combination of orders of this Commission, funds of the Applicant, and skill of its eminent landscape architects, can be any more successful in putting the earth rocks and trees of Storm King back together again, than were 'all the king's horses and all the king's men' in the case of Humpty Dumpty. Painting concrete green cannot deceive its beholders into believing that it is the handkerchief of the Lord, or, if it can, this Commission should not, in the absence of some overwhelming economic necessity, direct such deception."

In increasing numbers of cases under the same or similar statutory and court criteria as in Storm King, courts will have to balance cost against beauty, to determine what really contributes to "the elevation of mankind."

A second historic legal problem for conservationists, that of "standing in court," is probably a thing of the past. The basic Storm King case ruling, that "those who by their activities and conduct have exhibited a special interest in [the] areas . . ." of "the aesthetic, conservational and recreational aspects of power development," has been followed in several other important cases. These include those in which a federal district court has enjoined a $200,000,000 expressway to be built in the Hudson River valley. The broadening of standing in the conservation cases is, also only one aspect of a lawyer movement of the law upholding the standing of groups of persons with non-precuniary interests in Federal Communications Commission cases and the reapportionment cases.

In the FCC cases, by far the most significant is the decision of then Circuit Judge Burger, now Chief Justice of the Supreme Court, in the "United Church of Christ" case, in which he rejected a challenge by the FCC to the standing of a group of citizens of Mississippi who complained that a radio station was guilty of racially discriminatory programming.

Of course, for success in court a conservationist group must have more than standing. The court must have jurisdiction of the subject matter and, most important, there must be something substantively illegal about the project under attack.

Any meaningful discussion of jurisdiction of the subject matter necessarily involves a greater number of technical questions of great sublety. Only a few basic points can be made here, the first of which concerns sovereign immunity. The doctrine of sovereign immunity—that the sovereign United States or any one of the fifty sovereign states may not be sued unless it specifically consents to suit—is, to some degree, a cross we may still bear from the days when the law said that, "The King can do no wrong." That was, of course, simply another way for the king to assert his chief claim to immortality by ruling: *L'Etat, c'est moi.*

The rule of sovereign immunity, precisely because of its inherent injustice and its basic contradiction of our *consent of the governed* theory—our belief that the most just and beneficient of all sovereigns has granted us "certain inalienable rights," among which are "life, liberty and the pursuit of happiness"—has had large sections cut out by both statutes and judicial rulings. Some shreds of it still remain, however, and when lawyers for a government agency, or for a utility company granted certain governmental powers such as that of condemnation, seek to avoid the substantive question of whether their projects are substantively legal or illegal, they pick up one of the shreds of the sovereign immunity doctrine.

Whether any such shreds remain in a case in which a court has tried the issue of the substantive, legality of a project and found certain integral aspects of it illegal, is a question at this moment before the Second Circuit Court of Appeals in the Hudson River Expressway case, and which may be before the Supreme Court before the summer of 1970.

The second jurisdictional problem which can be indicated here, without involvement in discussion suitable only for law reviews, is that of the reviewability by courts of administrative rules and determinations. It is an interesting irony of history that in the Thirties and early Forties—the New Deal period—the persons and groups fighting for broad reviewability of administrative decisions were primarily right of center. They looked to the court to stem the tides of social and economic reform being effected by the National Labor Relations Board, the Securities and Exchange Commission, and other New Deal agencies. "Big government" was evil to those on the right; it was salvation to those on the left.

In large part, the struggles of the conservationists and environmentalists are now struggles against big government. Virtually every important project that would appropriate for a sepecial use any resource which the conservationists seek to preserve, by representing what they hope is a large majority just awakening from silence, involves approval or actual construction by a government agency. Unless some mechanism exists for review by an agency of government whose orientation and training is general, conservationists feel that literally every river, mountain, plain, and city will be appropriated by the Federal Power Commission, the Army Corps of Engineers, the Atomic Energy Commission, or some other administrative agency whose purposes and *raison d'etre* are parochial.

The Army Engineers' conviction that dams solve all problems—in modern times, if not in the days of Noah's troubles—has been documented. The Federal Power Commission's world is that of power. More kilowatts are, to them, synonymous with progress; and to oppose progress as defined by utility companies is to oppose the principles upon which our nation was founded.

Reviewability of administrative decisions by courts has two aspects: First, is review provided for? Second, what is the scope of review? Some of the determinations of many federal agencies—such as the Federal Power Commission and the Interstate Commerce Commission—are specifically made reviewable by statute. But review of many agencies' rulings is not specifically provided for in the statutes creating them. Included in the second category are the Army Engineers, agencies of the Department of Agriculture and Department of the Interior, and others whose powers of appropriation of resources are vast, even frightening. The line drawn between the agencies whose determinations are specifically reviewable and those not specifically reviewable is a line drawn by accidents or patterns of history which have no relationship whatsoever to the size or importance of the projects or other actions which are the subjects of the determinations.

Moreover, the kinds of decisions specifically reviewable are mostly those which determine private rights, such as those to build a power plant or to prospect for gold on the public domain. It is an interesting aspect of our laws, and perhaps of our scales of values, that the rights to appeal from a determination of a zoning board as to whether children may erect a tree house or a family add an upstairs toilet to their home, by both the applicant and the opponent, are clearly and precisely drawn; but the rights of a whole community or group of communities to secure court review of a determination by a road-building agency to literally destroy them are not at all clear!

Fortunately for conservationists, the rule emerging from recent Supreme Court and lower federal court decisions requires rejection of any contention of non-reviewability unless review is specifically forbidden by the terms of the law creating the agency or unless that is the necessary and clear direction from the law's legislative history.

The more grave problem is that of the *scope of review*. It is the all-but-universal rule of court review of the rulings of administrative agencies that the scope of review is very narrow. The court may not retry the issues. Only if the administrative decision has no rational basis or no real evidence to support it, or for some error of law, may the court reverse it. This rule places a hard enough burden on the litigant in the ordinary case where there is a limited record of clearly identifiable papers and proceedings upon which the administrative decision was based, and only one or a small number of agency personnel investigated and determined the matter.

Without some error of law, it is an almost impossible burden upon the citizens' group litigating the factual issues when the project is vast. The record of administrative action literally fills rooms with papers of every kind and description. The number and identity of persons who worked on the matter are unclear, and the agency vigorously defends its own determination. To this should be added such problems as the limited means of the citizens' committee; the remarkable talent of most administrators and their biologists, engineers, and other professionals and artisans to mask the answer to the simplest of questions in gobbledegook and erase from the dictionaries the words "yes" and "no." One can understand the reaction of most people to the first proposals to fight the project: a feeling of the utter powerlessness of a citizen against the vast monolithic government and its creeping concrete!

The beginnings of an answer to the scope of review problem may lie in the Storm King Case in which it has been held that agencies have a duty to ascertain all of the relevant facts, and not stand by blandly calling balls and strikes on the competing parties.

An aroused younger generation, seeing in the wedding and not the divorce or warring of man and nature the same righteousness they see in meaningful civil rights and racial justice, can push courts and legislatures to resolve this and other basic environmental problems. Moreover, court decisions interpreting laws can be overruled by changing the statutes.

In the final analysis, it is the political process which must shape environmental law. Vast numbers of statutes on federal, state, and local levels are required to define peoples' substantive rights in their lands, air, and waters. The substantive illegality of a project under attack must be found in a statute or in some modified common law rule not yet generally promulgated by our courts. Many thoughtful teachers and students of law are attempting to refine theories of the existence of an environmental right *per se*, based upon present constitutional provisions or on existing common law rules. Thus far, no court has decreed such a right. The primary hope for such a right is in our legislatures.

Mr. Scheuer. Let me say that Mr. Sive is perhaps the founder of the environmental law movement as we know it in our Nation today. He was counsel to the Sierra Club at the time they pressed the monumental and historic *Con Edison* case in which Federal Circuit Judge Paul R. Hays, who taught Dave and myself labor law at Columbia Law School, decided in a monumental case that Federal agencies have a duty to intervene to seek out the truth, to seek out the public interest, to find all the relevant facts, and, as Mr. Sive stated in his article, "not stand by blandly calling balls and strikes on the competing parties."

(Discussion off the record.)

Mr. Scheuer. Dave, it is a pleasure and a joy to have you here today.

STATEMENT OF DAVID SIVE, ATTORNEY, SIERRA CLUB

Mr. Sive. Jim, I really feel grateful and I feel terribly honored, and indeed, unduly honored, by the things you say, and it isn't really just mere modesty when I say I feel I am unduly honored.

It has happened before that occasionally one receives honor he should not receive.

But one thing I want to make clear in the record and I think most people know it; that is my only personal participation in the case which Mr. Scheuer mentioned; that is, the important case involving Storm King Mountain, came after the reversal by the circuit court of the original grant of the license, and the legal credit for the reversal; that is, the proceedings up to the remand, is not mine at all. I was a member and a leader of the basic organization but not the attorney.

The attorneys for the Scenic Hudson Preservation Council through that reversal were the Paul, Weiss, Rifkind, Garrison firm, primarily Mr. Lloyd Garrison, and also one of his associates, Albert Butzel, and I want the record to note that because this has happened once before simply through my involvement in the proceedings after the reversal, when a number of national organizations began to participate in this proceeding including the Sierra Club, which I represent.

Well, I won't bother with denying the several other honors which Mr. Scheuer confers upon me, primarily for the sake of time which I know is limited by all of you gentlemen.

And I will also apologize for not having right with you at this time the prepared statement of mine which I do wish to place in the record. The principal excuse is, I rush literally morning, noon, and night every day and night in this same matter, in this same series of problems which we now call the environment movement, and every day and night will be consumed until at least April 22.

But going to the actual matter of the legislation which is before your honors and committee, I can simply say at the outset that, again, I deny one thing: I am certainly not an expert on education. My expertise in that is simply my trying to bring up five children, two of whom are with me today. However, I think I have some particular experience, perhaps some expertise in the broad problems, the politics and the law in what we now call the livable environment or environmental movement, and which has perhaps previously been given the narrower term of the conservation movement. And that is that at the base of this, as well as every other significant national problem, is simply a problem of education.

This may seem a little bit disloyal to my own profession, lawyers, and I certainly do believe that much can be done and has been done for the environmental movement in the courts and in direct legislation conferring duties on persons to avoid pollution, to preserve the environment, to save different areas of the country. But at the base of this is simply the attitudes of men, women, and children, and finally I think we are focusing on that, both through the national movement culminating on April 22 and through, and I think even more important, through items of legislation and programs such as this bill proposes.

I might here at this point say that I have been acquainted and followed for many years, I must admit at first through personal friendship, but secondly simply through this kind of interest in this. I follow what Mr. Scheuer has done in many different fields relating to the environment, and I have always pointed to his involvement in this as proof of one of the basic principles, that the involvement of persons in the environment and protection of it and protection of areas throughout the country is at least equally and maybe primarily the problem of persons in the cities, representing the inner cores of the cities.

I could go a long time explaining why the protection of the environment, which may seem to be less important to persons who have not yet shared to the full degree to which they should share our affluence, why it is more important to them than those of us who perhaps are more fortunate and have shared a bit more of that affluence and could use some of that affluence to take a trip to the Cascade Mountains or to the Grand Canyon.

So I think what Mr. Scheuer has done is actual living proof of that principle.

Turning to the problem of environmental education, I can go to as recently as 35 minutes ago where I passed along, coming here, Sickletown Road in Rockland County, and there is the root of our environmental problem.

Here is a road that goes through a still unspoiled area of Rockland County in which I live. It would be the most lovely lane, lovely place for any person to live and take a walk along the land.

But what is it? It is a garbage dump, garbage dumped by individuals, by the town of Orangetown, by various persons who don't want to pay what we have to pay in Rockland County, to a private purveyor of garbage.

It is dumped, and we are not going to get to the root of our environmental problem by simply forcing more duties on people or court cases or other ways in which I would try to use my lawyer's arts.

We must change the ways people look at the land and the manner in which they live.

We must somehow convince people that roadsides and campgrounds and city streets are to be treated as their own living rooms, and this can only be done through educational programs of the nature of those which I think can come out of this legislation.

Now just to give you a few examples of the limitations of law and the imposition of duties, I think they are particularly important in connection with the key problem we have, which I think was alluded to by the gentleman that preceded me.

That is the basic problem as to whether we gear our national force and energy and our whole civilization toward simply a multiplication of goods and services, toward increasing the gross national product, and the most fundamental educational and political job we have in the environment is to direct ourselves toward something different from the simple multiplication of goods. It may seem as though this is what all us conservationists say and perhaps a somewhat hackneyed and trite observation, but in this all that I do is go back to one of the gods and one of the founders of our environmental movement whom many of us are going back to for many other lessons these days, and that is Thoreau. And, if I may just use this occasion, and I think he is worthy of quotation before a congressional committee, even 120 years after he wrote Walden, just one quote which I think is the heart of our environmental and educational problem; that is that "most of the luxuries"—and I quote from Walden—"and many of the so-called comforts of life are not only not indispensable but positive hindrances to the elevation of mankind."

Mr. Reid. Do you want to read that once again?

Mr. Sive. I would be honored to.

> Most of the luxuries and many of the so-called comforts of life are not only not indispensable but positive hindrances to the elevation of mankind.

Now if I may be somewhat romantic, let us say I would certainly believe that the function of your committee as well as that perhaps of all congressional committees is to promote the elevation of mankind, and I think we have now begun to learn that the elevation of mankind is not simply promoted by increasing the number of physical luxuries and the so-called comforts of life, and that indeed some of them may be positive hindrances to this elevation.

And this again can only be accomplished by educational programs which turn the minds of men and women and children to have a certain ethic and a certain feeling about land and resources and a certain reaction to the beauty of land.

And here perhaps one other observation which may seem somewhat basic and, again, somewhat romantic, I would like to make, now that we are concentrating a great deal on national goals and national aims, and we are also concentrating on the environment.

Well, I have long believed that there is a very definite relationship between what is within the land in terms of its resources and its natural beauty and the duty and responsibility of people who are in that land.

And if our Nation is one which is blessed with the greatest of resources and the greatest of natural wonders and the greatest areas of natural beauty, from the place where I once tried to lead Mr. Scheuer in late April in the center of the Adirondack wilderness to the Grand Canyon and the Smokey and Cascade Mountains, then certainly we have I think some higher duty to fashion some kind of ethic, some kind of principle by which we treat this land with these resources and combine that with the technical advancement and technical knowledge we have.

That is what I think this environmental bill must do. It must change the minds and attitudes of people and, until we do that much of what we may accomplish through laws and court decisions may be of little avail. Because it doesn't really do many of us much good to, let us say, save the face of Storm King Mountain, which is the object of a tremendous legal and litigation effort, and then right along the roadside at the base of Storm King Mountain simply look at the beer cans and the discarded garbage of that town.

We can only do that through educational programs. Now I think there is just one other observation which I would make and beyond that, if I can answer any questions, I would be delighted to.

But I must again state my own limitations as not an expert on educational means and the precise techniques which are embodied in this legislation, although as far as my own inexpert judgment would be concerned, I think it is the right means to create the body which you do create and provide for the application of funds to it.

But the other observation is simply this: That there has been mentioned here this morning just before I came in and there is involved everywhere when one talks about the environment the matter of interdisciplinary approaches, and I think that is one of the objects which would be furthered by this educational program.

Well, the requirements of interdisciplinary approaches are written right now in another very basic act and this is more in the legal field, the Environmental Quality Act, which became law on January 1, 1970.

There is a matter of legal requirement that Federal agencies in dealing with matters involving resources are required to exercise an interdisciplinary approach and, if the program which is provided for by the bill before your honors can provide the educational background for that, then that, too, is essential.

Mr. REID. If I might interject on that point, it is my understanding that Russ Train of the Environmental Council is now requiring the several departments pursuant to that section to file what I think he calls section 202 reports.

As I understand that, it means that a particular department must indicate whether what they are doing is having major and fundamental substantive effect on the environment.

The problem is that I don't think that the AEC or the Department of Agriculture is going to admit what they are doing has dramatic impact or if it has other kinds of impact on individuals.

The problem seems to be to require an interdisciplinary section 202. Is there such a requirement in the law?

Mr. SIVE. Yes, there is, and I think actually it is section——

Mr. REID. 210?

Mr. SIVE. No, section 102 of the act and there are some rather definite problems and subtle questions of law under the act, which I have discussed with several members of the Council and other persons. Several persons including myself are trying to complete some analysis to go into the law reviews.

The basic point you make is correct. I might say the members of it are really the persons who can lead us into this interdisciplinary approach.

Most of you know the approach of Russ Train and Bob Kohn, two of the three members.

The basic problem is directly in line with Your Honors' comments, that most of our resources are governed and disposed of by administrative agencies and, if we just stay on the Federal level, the Federal Power Commission, the Atomic Energy Commission, the Army Corps of Engineers, the U.S. Forestry Service, et cetera, and each of those agencies is a single-interest or narrow-interest-oriented. The precise way that works is documented in some of the litigations which have developed this environmental law field, including the Storm King case.

The problem is that the Federal Power Commission wants to create power, the Atomic Energy Commission believes in more atomic energy, the Army Corps of Engineers in dams, dikes, causeways and little else, much of which is documented now, and we don't have this interdisciplinary approach and that I think can be compelled if my construction of the Environmental Quality Act is correct.

And I think that's precisely what you are referring to that Mr. Train is attempting to do.

But I would go further again that, no matter what the Environmental Council can do, if they require the Army Corps of Engineers to hire experts on scenic beauty, it does it little good if we go to the scenic beauty—and we may go right down to the floor of Yosemite Valley and we are met again with the cutting down of the trees and the garbage strewn around, and the way in which people act toward the land simply doesn't reflect a certain view of it and a cherishing of it and regard for it and husbanding of it, which can only be by changing the minds of people, which is a particular educational problem I think we have here.

Mr. **Reid**. Does the act go far enough? Does it say that somebody within the department must say what this does on human beings or fish?

Mr. **Sive**. By "Act," you are referring to the Environmental Quality Act?

Mr. **Reid**. Yes.

Mr. **Sive**. I think there must be a responsibility. I think there must be some discussion by persons who worked on the act and on the legislative history of the act.

It is not definitely as clear as a matter of law as I would like it that the duties of the Federal Power Commission or the Atomic Energy Commission are expanded, that their jurisdiction is changed.

This turns on subtle constructions of the phrase "to the maximum extent possible," in the very beginning clause of section 102, and this is a matter which is presently before courts in a couple of cases which I am involved in.

So I would simply say that I would like it much clearer. But I recognize that that act is a fundamental step, it and every other, including yours here, too, will be subject to hearings and possibly compromises of language.

When we talk about an interdisciplinary approach, again it is only by changing the minds of people by educational programs such as that which you provide for here, to at least give us a start on, that we can accomplish this.

And I will make just one further observation to demonstrate this, only because it is so clear in my own mind.

This last summer my wife and I, after talking about it for 20 years, went to Europe and I visited Germany and Austria and, going through Austria the one thing that struck us more than anything else was the manner in which people cherished every acre and every square foot of land.

Not only could you not find beer cans along the road, but you would see elderly men with hand scythes cutting grass in a 3-foot wide path along the roadway.

The reason they do that is because they have many more people per acre and they have learned the very hard way, through hundreds of years that, unless you do that, the land goes.

Our history is that of the frontier, and although the physical frontier disappeared according to historians around 1890, our emotional frontier still hasn't disappeared.

We still believe and act on that belief that somehow the land, if it isn't privately owned, or if there is a large piece of it, can just be wasted, just be a receptacle, just be a toilet, that there is a difference between the duty we owe to the piece of land we don't own and the piece of land we may own. Only through some educational programs which really reach deep can we change that attitude, and really give some effect to this environmental movement which is now sweeping everywhere in every political and legislative process.

I would simply address those observations to those Honors and ask leave to again supplement this with the written statement which I just did not have the time to complete before appearing here, but I will shortly, next week.

Mr. **Brademas**. All right.

Mr. SIVE. And I thank you for the honor of being here.

Mr. BRADEMAS. Mr. Scheuer?

Mr. SCHEUER. Mr. Sive, I want to thank you for your marvelous testimony. I am only going to ask one question.

You gave us a very beautiful and moving quote from Thoreau. What do you think, as a leader in perhaps the environmental consumer movement, ought to be our education attack or political grassroots attack on the kind of GNP galloping consumers you mentioned?

How do we convince the average housewife that when she buys an electric hair dryer or electric toothbrush, an electric carving knife—all of which I think would fit in with Thoreau's definition—that she is inevitably contributing to environmental pollution, since apparently there is no way of producing electric power, either through the fossil fuels, coal, oil, gas, or through atomic energy, that doesn't have a polluting fallout?

How do we convince the American family to perhaps abandon the idea of the third car and to use mass transportation?

How do we convince them to give up some of these cherished comforts and conveniences and do things in order to achieve the greater good, perhaps a greater level of total satisfactions of which they may not be consciously aware now?

Mr. SIVE. Well, that really gives me the floor to make one suggestion which I have stated in several places and maybe is in part an answer to your question.

I think that one of the really needed things in this whole environmental movement, and the problem of gearing our production to our elevation, is a study by a body, and it may very well be the university groups and others who would be funded by this legislation, which would run through every consumer product we have and try to figure out how much does that take out of irreplaceable resources, how much does it consume and how much hardened product which cannot be put back into the earth and water does it take away and how much does it contribute toward what we ultimately seek.

Just to give an example, you mentioned electric appliances.

I would say many electrical appliances even the greatest wilderness advocates use and want, and it may well be with the proper siting we can have most of the electricity we want and not irrevocably damage the environment.

But let us take aluminum soft drink cans. Is there any difference in the world toward our elevation or even our comfort between something that can be disposable and can be turned back into the earth and an aluminum can?

None.

Take the vast amount of paper we use. I think somehow we can cut down, maybe by changing our laws to restrict and discourage junk mail.

What social progress we would achieve by that alone, getting rid of some of the mail and saving several thousand acres of pine forest.

If we can go through each and every product we use, from a toenail clipper to a box of Kleenex, and try to inventory those, then I think we can begin to convince people that you are not really going to lose much.

There is one other problem related to this, a very basic one again, which troubles me very much and which may well be again the subject of study by groups that would be funded by this act, and that is the relationship of the environmental movement to the ghetto, to the inner city, to the groups of the population who have not achieved the affluence which enables us to turn to other things.

Mr. SCHEUER. May I add, I want you to answer this question having in mind that some of us liberal Congressmen have been criticized for our concern about the environment. We have been accused of copping out of the improved education struggle, improved civil rights struggle, improved urbane life struggle.

How do we answer this? How do we convince the black and the Puerto Rican-Americans that they have as much a concern in this limited planet, this space ship, as we do and that it isn't a cop-out but rather that it goes to the heart and core of their problem?

Mr. SIVE. I will give you the answers I have given because they have intimated I cop out because whatever talent and energy I have I have mainly put into this instead of perhaps direct participation in civil rights causes, and I will preface it by stating what is true of Mr. Scheuer whom I know personally for so many years and, I assume, the others in your committee.

Mr. SCHEUER. Absolutely.

Mr. SIVE. And I don't think there is anybody in this world who has a deeper dedication to racial equality and justice and civil rights than you; I will say this as a personal matter.

I will go on to say I think I have as deep a dedication to that.

There are two answers. One is a theory of mine which still has to be studied but still is a theory, that if we take the total of our sum of goods and services and we more equitably distribute them and we lop off a bit like the aluminum beer cans along the road which contribute nothing toward anybody's elevation, then I think there is sufficient to distribute to those who have not shared in the affluence.

I am convinced of that, although I am not an economist, and I would like people to study that.

Second, I think it is correct that generally speaking those groups of the population who have been fortunate enough, by simple historical accident, to perhaps have gone beyond the problem of getting out of the ghetto, and I can say here I would just go back one or two generations in my own family history. It is only physically and I think figuratively when you solve that problem of the day-to-day necessities, that you can turn to matters such as the environment and the preservation of natural beauty.

If that is so, then all the more valuable and necessary and urgent is the saving of this for those who have not yet done that, because if, as I am confident, within not too long a time there can be this greater justice in the distribution of goods and if 10, 20, or 30 years from now all that is precious in the environment—let's just take as an example the Grand Canyon or the Adirondacks or Storm King Mountain—if that is then gone, then those who will only share in the affluence a few years from now if we really devote ourselves to it will never know it, and that, I think, would be the ultimate tragedy.

I think that is one of the answers to this problem of relating the environmental matters to groups of the population who still don't share as much as they should in our society's affluence.

Mr. Scheuer. Dave, thank you very, very much.

Going off the record—

(Discussion off the record.)

Mr. Scheuer. Back on the record.

Mr. Brademas. Mr. Reid?

Mr. Reid. I have two questions.

One is the broad question of what should be done in this legislation perhaps by appropriate language which will indicate in the schools and the communities of adult education what an individual can do relative to the environment. I am thinking, in terms of your testimony, not only of ethics which I think you put very well, but what can an individual do perhaps in legal terms?

I have been concerned for a considerable period of time that in the State—and this is my second question—that the State is fundamentally arbitrary in these matters. A decision is made by a roadbuilder to ram through a road because Con Ed needs a powerplant and they cite the need for the location and start running the high-tension lines and so forth.

I have long felt that before an action should be taken of that kind the only thoughtful thing is to have a State requirement that the company require the judgment of the local citizens as a matter of approval.

If the Government said you could never do that, you would never build any more roads—that wouldn't disturb me too much—but the question is what can we do in the State of New York and elsewhere that would be helpful to get citizen participation in environmental matters, on environmental values and community values, what can we do in this respect?

Mr. Sive. To answer the first part of your question, I think the primary legal thing that can be done is being worked on right now, both on the Federal level and on the State level, as I learned yesterday.

On the Federal level and you, sir, may actually be the author of one of these bills, there are a number of items of legislation providing for citizen suits in environment matters.

There was a hearing just 2 weeks ago in which I testified on one bill, I think proposed by Senator Muskie, and I know there are a number of them.

They raised certain problems but certainly that basic provision should be made, and I think people have now gotten out of the fear that there will be a terrible inundation of lawsuits.

On the State level I think the very same thing is being worked on right now by Governor Rockefeller's staff. I only know that yesterday the secretary of the bar association committee which I chair on natural resources, spoke to me and asked me to consider legislation coming out of the Governor's council's office, to provide a system of better participation in hearings by the public service commission on matters before it.

Mr. Reid. The trouble is that it reaches to hearings but not to the power to make a decision and what they are trying to do in my judgment is a cosmetic endeavor to give the appearance of hearings and participation when in fact the decision has largely been made and, while there can be a hearing, it can be very difficult to reverse a decision or involve the citizens in the actual decision itself.

Mr. SIVE. Well, there are two specific ideas that I have on that and these I have developed with some particularity because I have been involved in it several years.

One is at the administrative level there must be some right of discovery, using a technical term from civil procedure rules, some right of discovery to citizen groups or their representatives or the individual appearing in an administrative proceeding. The right should be analogous to the right of discovery, let's say, under rules 26 through 37 of the Federal Rules of Civil Procedure in a plenary action, and the reason is so clear from so many experiences of mine.

I will just allude to one of a very close friend, a leader in the conservation movement in Long Island.

Irving Lilse, a lawyer in Babylon, represents a large group of persons along the north shore, who has appeared in connection with a proposed atomic plant in that area.

He received notice of the hearing on the plant 20 or 30 days before the hearing.

How man he find out in that 30 days how can he begin to know about this unless he can find some documents, perhaps see the files, perhaps take depositions? I don't know exactly but some means of discovering the information in the hands of the other parties is necessary to taking sensible action.

Going to the other end of it, the ultimate decision is made by the administrative agency with a single or narrow interest-oriented view.

That may be reviewed by a court but, as you know, the court review is very narrowly limited to simply finding whether there has been an abuse of discretion, and the job of reviewing it by one before the court amounts in most cases to getting a direct verdict. The problem is getting a larger forum which isn't narrow interest geared.

That again is a difficult problem and I can again say I have put a lot of thought into that, to the extent of making that a main theme in a law review article to go into Columbia Law Review next month, where I unfortunately attack this problem with a minimum of expertise in administrative law.

But I would state here that administrative law experts and congressional bodies with those concerns must somehow bite into the effect of the rule which severely restricts review by courts of the determinations of administrative agencies, at least when they are making major determinations about the disposal of major resources.

That requires study by persons much more expert than I, but I certainly believe they must be at your beck and call.

Well, if those two things are done, if you get at the beginning some kind of discovery within the administrative proceeding and at the end some broader and deeper review of the ultimate decision, then I think you've gone a long way.

Mr. REID. Do you have any suggestions as to what might be put in the bill on citizen participation, or the law, what the individual can do?

Mr. SIVE. I would like to be given the opportunity simply until early next week to consider that and, if I can, suggest specific language.

Mr. REID. That would be a very helpful thing. Thank you very much.

Mr. SIVE. We will do that.

Mr. Reid. Thank you very much for your most interesting and pertinent testimony.

Mr. Brademas. Thank you.

There is a growing personal interest in this in law schools throughout the country.

Mr. Sive. Tremendous. I have personally spoken to students at five different law schools; every law school now has an environmental law society and several. I could probably refer you to several hundred students this evening or Monday to aid you if you need aid, and I think you and others can use this tremendous talent.

Mr. Brademas. You have been most helpful in your commentary and statement. Thank you very much.

Mr. Sive. Thank you very much, sir.

Mr. Brademas. The Chair would like to observe that we have four more witnesses scheduled. We would like to conclude this morning if possible.

The next witness is Mrs. Arlene Weisberg. Mrs. Weisberg, please go right ahead.

STATEMENT OF MRS. ARLENE WEISBERG, BRONX TEACHER, MASTER TEACHERS PROGRAM, WAVE HILL CENTER FOR ENVIRONMENTAL STUDIES

Mrs. Weisberg. My name is Mrs. Arlene Weisberg.

I am employed by the New York City Board of Education at Public School 46 in district 10, the Bronx. I am presently on leave of absence as a master teacher for the Wave Hill-Lehman College environmental studies program.

I wish to thank Mr. Brademas, the members of the committee, and the gentlemen at the hearing for inviting me to speak on behalf of the Environmental Quality Education Act (H.R. 14753).

I think that we are all agreed that environmental education is education for survival. If we do not institute a crash program to teach our children the ecological facts of life, we may not be around long enough to worry about any other educational issues.

Teachers, though well aware of this great need are hesitant to step into an area for which there is little or no prescribed curriculum and few materials on the elementary school level. However, the world may come to an end before a satisfactory environmental curriculum is developed and implemented to meet the standards of various boards of education and local school boards.

There is a great need for intensive teacher training and for provision for experimental materials now.

How is it possible to make water pollution vital to a 7-year-old? How do we communicate the urgency for change and for positive action? A teacher standing in front of a classroom and "teaching" water pollution is not the answer.

If the child is to become aware of his environment, to see himself as an individual acted upon by the environment and in turn acting upon the environment; if the child is to realize his own potential as a change-agent a different kind of classroom is necessary.

The Wave Hill/Lehman College program in district 10, Bronx, funded by the Ford Foundation is experimenting with environmental education with the emphasis upon the "discovery method." Many of our methods are based upon the theories of John Dewey, Maria Montessori, Susan Isaacs, and Jean Pflaget and the models of some of the British infant schools. We believe that a child becomes aware of his place in the environment through experimentation with the materials of the environment. The classroom must provide many materials that can be experimented upon and most importantly, "used up." It is ironic that in our modern culture of disposable everything and "no deposit, no return" bottles, children's workbooks cannot be written in because they must be used over and over again.

The classroom setup must allow for the development of the skills to observe, to question, to explore, to be aware of problems, and to try possible solutions.

Mr. BRADEMAS. I wonder, Mrs. Weisberg, if you would not mind if I were to interrupt you and we will just put the rest of your statement in as if read and that would enable us to ask you questions about some recommendations you may have.

Will that be agreeable to you?

Mrs. WEISBERG. Fine.

Mr. BRADEMAS. Because Mr. Reid and I have both read through your statement.

(Remainder of statement of Mrs. Arlene Weisberg to be inserted at this point.)

STATEMENT OF MRS. ARLENE WEISBERG, BRONX TEACHER, MASTER TEACHERS PROGRAM, WAVE HILL CENTER FOR ENVIRONMENTAL STUDIES

A child who has had the responsibility for planning or maintaining an aquarium in the classroom may be better equipped to understand the problem of water pollution in terms of own experiences.

In order for the child to understand today's environmental problems, air pollution, water pollution, waste pollution, noise pollution, he must first understand the interrelationship of things, of himself and all of nature. Education must be presented not a a set of separate subjects but rather as an integrated approach to everyday living.

A small group of children want to keep a gerbil in the classroom. This activity involves building a cage, finding out when and what to feed him, his habits etc. This one activity involves mathematical measurements, following instructions, reading, science, working with tools and money values. The classroom emphasis is not broken down into math, science, reading and arts and crafts but the integrated emphasis is upon how to solve the problem of housing a gerbil. The child who perceives a problem and works through to a solution learns to value himself and to value his place in the environment. Any degradation of the environment becomes a degradation of himself. We do not want to raise a generation of young people who think of themselves as separate entities, as apart and distinct from the environment and who think nothing of disposing of their litter along streets and public highways.

Many children in the inner-city are "turned-off" from school. One of the strongest arguments has been that school has no relevance to the outside world. The discovery method uses that which interests the child, that which is relevant to him, his immediate environment. In the process of exploring the immediate environment, the child begins to form judgements. Some things in the environment are undesirable. How can we improve the undesirable elements or prevent them from occurring in the future? The child who has been encouraged to experiment and fail and try something else, will have the courage and self-assurance to become a change agent in his environment.

Because of the forward-thinking of the administrators in District 10 especially Dr. Charles Shapp, the District Superintendent and the directors at Wave Hill, we have been able to conduct teacher workshops and to try out our ideas in the classrooms. It has been most gratifying to visit the classrooms and see children enthusiastically involved with the problems of waste pollution in their school, to see groups of youngsters actively experimenting with the effects of air pollution and water pollution. However, our small efforts seem inadequate when the vastness and complexity of the environmental problem is considered.

Many teachers and administrators are extremely interested in any programs dealing with the environment. Wave Hill has been visited by principals, coordinators and teachers from all over the city and the eastern seaboard, who want to share in the results of our efforts. We are enthused about our successes and would like very much to branch out into other areas of the city, but we are unable to do so because of limited finances, personnel and physical facilities.

Our staff has organized field trips for classes to come to Wave Hill with their teachers and parent volunteers. We have twenty-eight acres of beautiful natural area to explore and enjoy. We have ten different areas of investigation prepared for the teachers complete with motivational activities, guide sheets and follow-up suggestions. We have assembled the manipulative materials necessary for the investigations. Yet we must substantially limit the number of classes who can come because of inadequate toilet facilities, lunch facilities and personnel for supervision. It is frustrating to have to say no to interested teachers and eager children because we lack the money to utilize our facilities to their full potential. It is doubly frustrating because our program has been successful and inviting enough to arouse interest in other geographic areas.

Fortunately some curricula have already been tried and have proven successful although there is always room for improvement. The most immediate need is for the appropriation of funds, as soon as possible, to develop the curricula and to put them into effect as soon as possible in the classrooms.

Programs, like our own seeded by Foundations like Ford and Old Dominion, will die out before they are full grown without the necessary financial help from the Federal Government, so well provided for in this bill.

I am optimistic that our environmental problems can be solved if money is appropriated on the local level in all communities *right now* for teacher training and for materials. In this way, we will be using our greatest natural resource, our children to assist in their own growing awareness of the problems we all face.

Mr. BRADEMAS. One of the questions I would put to you is with respect to your comment on page 2 that you have been able to conduct teacher workshops and to try out your ideas in the classrooms.

When you say teacher workshops, did you mean workshops that are conducted at Wave Hill for teachers in other schools in the city or for your own teachers?

In other words, whom are you serving and to what end? What happens at these workshops?

Mrs. WEISBERG. At present we are serving 24 teachers in district 10 and about five teachers from district 12 in the Bronx.

They attend workshops through the spring once a week and there will be an intensive training program in July for 4 weeks which will be from 9 to 4, in the methods of exploration of the environment and using the materials of the environment for classrom study.

Mr. REID. Could you elaborate on those methods for a little?

Mrs. WEISBERG. Well, I can give you some examples.

Mr. REID. We had a gerbil in here, but I was thinking——

Mrs. WEISBERG. We had the teachers experiment with actual materials, the kinds of things the children might find and bring into the classroom and explore all the possible potentials of these materials, such as shells, rocks, pendulums, plants, things of that sort.

Also we have taken our teachers out on the Wave Hill grounds to explore the possibilities of the kind of study you can do when you take a class outside.

We feel if we get the teacher through the process of doing these things, the teacher will be better able to communicate to the children the kinds of possibilities inherent in certain materials.

Mr. BRADEMAS. There is no program supported by the State of New York, I take it, aimed directly at environmental education.

Mrs. WEISBERG. Not as far as I know. We are besieged by teachers and administrators from other districts who want us to handle and service their districts, but we are very limited as to funds and personnel.

Mr. BRADEMAS. Where do you get your materials, curriculum materials? Do you develop them yourselves?

Mrs. WEISBERG. Yes, we do. We believe that much of the curriculum will come from the child himself, rather than going into the classroom with the prescribed curriculum.

We get many of our clues from the children.

Our first job in the classroom is to provide many materials, many interesting and provocative materials, and from the kind of materials the children experiment with and pick up we can see where the children's interest lie and do our planning from there.

Mr. BRADEMAS. Just two other quick questions. Do you get from the U.S. Office of Education any of the teaching materials that have been developed for use in the over 100 environmental programs that have been funded in schools across the country under title 3 of the Elementary and Secondary Education Act?

Mrs. WEISBERG. From the Office of Education and Information. We have sent for materials that are available. We have sent for many materials and we maintain a sort of research center at Wave Hill and we may have materials from the Office of Education and Information.

Mr. BRADEMAS. The reason I ask the question is the Federal Government does support programs not unlike what you do, and it might be helpful if it were possible for school systems across the country to take advantage and learn from what has been used elsewhere.

Mrs. WEISBERG. Except that I find many of the materials on wildlife and conservation and fish hatcheries and stuff of that sort we are not able to use to a very great extent in the elementary schools.

The great need is for materials on the level of the elemenetary school child, something that makes him aware first of all of his immediate environment and then gives him the impetus to push out into exploring the larger environment.

I would like to take exception to one statement that was made a few moments ago.

Mr. BRADEMAS. Yes, please.

Mrs. WEISBERG. About the ghetto child.

One of our large aims is to make the ghetto child a change agent within his own environment, not to wait for somebody from the outside to come in and say these things must be cleaned up or changed or wait until the ghetto child is able to remove himself from the ghetto environment, but rather to have him see the possibilities right now while he is in the elementary school and have him feel the power that he eventually can become a change agent in the ghetto environment.

Mr. BRADEMAS. You feel—and this is my final question—Mrs. Weisberg, that what you are doing is something that has commanded the attention of teachers in other schools in the city?

That is to say, you seem to be something of a magnet for others to come and find out what you are up to?

Mrs. **Weisberg.** There is a tremendous amount of interest in the city. All that is lacking is direction, funding, materials and personnel to get this thing going.

Mr. **Brademas.** That's all?

Mrs. **Weisberg.** That's all.

Mr. **Brademas.** Thank you very much, Mrs. Weisberg. This has been most helpful to us and I am delighted to see that you are pioneering in the field to which this bill is directed.

Our next witness is Dr. Edward J. Ambry, director of the New Jersey State Council for Environmental Education.

Dr. Ambry, we are pleased to have you with us.

I would like to suggest if you have no objection, that you might summarize some of the opening pages of your statement and then move ahead to give us some of your immediate concerns and recommendations, if that would be agreeable.

Dr. **Ambry.** Yes, sir.

REMARKS OF DR. EDWARD J. AMBRY, DIRECTOR, NEW JERSEY STATE COUNCIL FOR ENVIRONMENTAL EDUCATION

Dr. **Ambry.** Since time does not permit the reading of my prepared testimony, I will attempt to present a digest. In the opening statements, I congratulated all of you gentlemen for supporting this bill and stated that another identical bill H.R. 15934 has been introduced in the second session of the 91st Congress which has several other Congressmen joining your forces, and one in particular, Bob Roe, the newly elected Congressman from New Jersey.

Mr. **Brademas.** Kind of a first classman, I may say.

Dr. **Ambry.** Yes.

The other part of the opening statement identifed the fact that I hope I am qualified to speak, having been in the field of outdoor education and environmental education since 1939 and having had a long history of what might be termed leadership in this field, only to regret where I make a statement on page 3 that educational leaders who have contributed long, dedicated careers to environmental education have somehow missed the mark.

We have failed to move the establishment. We have failed to even make a dent in the curriculum.

Then my statement points out Wave Hill and other experimental projects across the country, literally hundreds of school districts that have gone into the theory of environmental education and have curriculum materials of varying degrees of authenticity, and that somehow we have not been able to marshal enough forces and manpower to create from these some viable models.

What I have stated is that if we are to move into more Federal funding, that we certainly not neglect looking at what we have already accomplished, and in one place I state that I hope we "don't invent the wheel again."

The other part of the testimony on page 4 indicates the purposes stated in the Environmental Quality Act and then I state that I have some concerns and they stack up something like this:

I am concerned that what this committee is calling for has been pointed out several times to the U.S. Office of Education and indeed to the President of the United States in the August 1969 report prepared by the President's Advisory Committee on Environmental Quality. I gave two quotes and, with your permission, I would like to read just the first one.

On page 13 of the above report is stated, and I quote:

> For our youth in school, Title III of the Elementary and Secondary Education Act enabled the establishment of over one hundred environmental centers; but no program was initiated to disseminate to the rest of the nation's teachers the teaching methods and curriculum materials developed at the innovative centers.

And I happen to be pretty critical of this particular lack of organization.

I also state in my prepared testimony that, in addition to title III curriculum materials, there are some other excellent sources and I brought with me several sources of the kinds of materials that have been developed by privately funded and individual school districts.

What I want to recommend, and I have gone on record on page 6, is that some provision be incorporated in H.R. 14753 for creating a central clearinghouse.

In fact, I would go further and call for the establishment of such a clearinghouse from funds which might even now be available to the U.S. Commissioner of Education in the newly enacted elementary and secondary education amendment which provides the Commissioner with 15 percent of the total appropriation to be used at his discretion, or from other funds which I now understand are available to the U.S. Office of Education from unexpended appropriations under title III.

Another concern is that your bill calls for pilot projects and my concern here is that we simply don't repeat a lot of what has been refunded through title III but that we take a look at those projects and select some of the better models and begin to test these out in various situations across the country.

I will skip through several pages.

On page 7 I have suggested a possibility of some priority organization for the bill and the priority might be achieved by assigning a certain percentage of whatever funds might become available to various parts of the legislation.

Also on page 7 I have several insertions which may or may not be important. Some of your legal assistants might take a look at these.

One suggestion that I have at the bottom of page 7, item 8, is that we need the technical assistance of local, State, and Federal agencies and that it would strengthen the act if the act could indeed call for establishment in each State of a technical advisory committee.

And then I go on to say that in New Jersey we have developed, over the past 3 years, a master plan for environmental education and this has been presented to Commissioner Carl Marburger, commissioner of education in our State. It calls for the establishment of such a committee.

Dr. Marburger is in the midst of initiating this program and I request that there be appended to my testimony a copy of the New Jersey master plan for environmental education.

Mr. **Brademas.** Permission granted.

Dr. **Ambry.** I have a concern about funding, after witnessing the dropout of title III projects after Federal funding has expired, and I wonder if in your funding you might not build into it some kind of a State or local support base that might allow 100-percent Federal funding in the first year and allow for graduated, 80, 60, 40, 20 percent, funding base over a 5-year period.

I am suggesting here that whenever the Nation is faced with a crisis, and we have reacted to crises in many situations before, we always come up with a group of national leaders who have been brought together into a national center for the study of whatever crisis the Nation is facing. I am so bold as to suggest that we might even call for in H.R. 14753 a national center for environmental education, which might be a separate kind of institution or might be linked into President Nixon's recent speech in which he called for a National Institute on Education; it might be that we could receive of one unit of the National Institute on Education being a National Center for Environmental Education. Such a center could operate one or two or three regional laboratories across the country which could give us a feedback of the materials we so desperately need in this field.

Very quickly, I express my appreciation to this committee for providing me the opportunity to testify in support of this exciting act.

That's as brief as I can be.

(Prepared statement of Dr. Ambry to be inserted at this point.)

STATEMENT OF EDWARD J. AMBRY, PH. D., DIRECTOR, NEW JERSEY STATE COUNCIL FOR ENVIRONMENTAL EDUCATION

First, I want to congratulate Congressmen Brademas, Scheuer, Reid and Hansen for introducing and supporting H.R. 14753 during the 1st session of the 91st Congress and for their sustained efforts during this series of hearing. I would like to extend these congratulations to Congressmen Vanik, Yatron, Rodino, Rosenthal, Dulski and Roe for joining with the aforementioned Congressmen in the introduction of an identical bill H.R. 15934 in the 2nd session of the 91st Congress. These bills will surely gain additional support. Secondly, I wish to express my personal appreciation for having been invited to testify before this Select Subcommittee on Education.

Thirty-one years ago, in 1939, while attending college, I accepted a summer camp counselor position at one of the camps sponsored by *Life* Magazine. The late Dr. Lloyd B. Sharp, Executive Director of these camps, and probably the most noted proponent of a movement in education identified as "outdoor education," opened up the eyes of this city-bred, young, energetic, about-to-be educator. He through his philosophy of education, has been a driving force for thousands of other educators across this nation and, indeed, around the world.

The most significant experiment and research in the field of "outdoor education", which has come to be known over the past ten or twelve years as "environmental education", was conducted by Dr. Sharp and the New York City Board of Education when several classes from Junior High School 118 in Manhattan and Public School 147 in Queens participated in a three week environmentally oriented experimental program at a camp in New Jersey in June 1947. The results of this experiment, published under the title, *Extending Education Through Camping*, showed, on almost every test administered to these youngsters and to a control group who remained in their city classroom during the same three weeks, that the camp group achieved a higher level. Incidentally, a recent publication, entitled *City to Country, Outdoor Education for New York City*, which recommends environmental and outdoor education programs for New York City school pupils, fails to mention the 1947 program to which I have just referred even though the research report on this experiment is used as a standard text in many college and university outdoor education courses throughout the country.

Since the 1930's hundreds of outdoor-conservation-environmental education programs have been developed in school systems in almost every state. During the past four years considerable emphasis on this type of educational program has been generated through federal funds made available under the Elementary and Secondary Education Act of 1965 and its subsequent amendments. In May 1968 there were one hundred and ten environmental programs sponsored by local school systems supported by this act.

Why, you might ask, should I be presenting this historical information? I'll answer my own question by stating that much has been accomplished and there is ample evidence to support this opinion. And then, I hasten to add that the accomplishments are scattered, fragmented, unorganized, and almost in complete isolation from what many educators and others consider the major thrusts in education yesterday, today, and perhaps tomorrow. Somehow, those educational leaders who have contributed long, dedicated careers to environmental education have missed the mark. We have failed to move the establishment. We have failed to make a dent in the curriculum.

At this point in time, with enough solid experimentation behind us, with the environmental problems crashing down around us, with the country's already stressed air, land, and water resources, with our highly urbanized and industrial society, and with the very quality of man's life at stake there is no room for further groping, no room for failure in our attempts to provide meaningful, relevant environmental education to young people and adults in the United States.

As U.S. Commissioner of Education James E. Allen, Jr., stated in a recent speech, "The teacher we intend to send into our public schools in 1980 is today a sixth grader somewhere in America. He or she must be taught—beginning right now—along with every American boy and girl about environmental quality, about ecology and about all of the complex and interacting elements that go to make them up."

There is no room for failure!

Concern for the environment of man has become a dominant social issue of our time. The problem is no longer definable in traditional terms of conservation or natural resources. It is now a question of the livability of the environment, particularly the urban environment. The challenge is as vast as an atmosphere free of cancer-producing chemicals, and as small as a child playing in a stream free of disease bacteria and poisons. It is a basic reaffirmation of man's value and dignity, and promise that the future need not be more and more of worse and worse.

H.R. 14753 the "Environmental Quality Education Act" is certainly a step in the direction which is urgently needed. It will provide, as stated on page three, for:

1. development of curriculum materials
2. pilot and demonstration projects to test the effectiveness of existing or newly created curriculum materials and data
3. dissemination
4. evaluation and assessment
5. preservice and inservice teacher education
6. contracts with institutions of higher learning for a variety of services
7. adult education programs
8. use of mass media for preparation and distribution of materials

The plan outlined in this legislation is urgently needed and I want to go on record as endorsing the overall intent of this Act.

There are some immediate concerns I'd like to share with this Committee and others. They stack up something like this:

1. The Act calls for curriculum development and dissemination (page 3, lines 3, 4, 5 and 10, 11, 12, 13). In my opinion, this is needed. However, we really cannot wait for the enactment of this bill. What we need *right now* is a method of retrieving and collecting all the curriculum materials developed through the more than one hundred Title III environmental education projects which were and still are operating. This is imperative, lest we "invent the wheel all over again." This need was pointed out in the August 1969 Citizen Advisory Committee on Environmental Quality *Report to the President and to the President's Council on Environmental Quality*. I quote from page 13 of this report:

> For our youth in school, Title III of the Elementary and Secondary Education Act enabled the establishment of over one hundred environmental education centers; but no program was initiated to disseminate to the rest of the nation's teachers the teaching methods and curriculum materials developed at these innovative centers.

In the appendix of this same report, on pages 33 and 34 the following statement appears:

> A fundamental objective of the experimental Title III program was that the best of the locally produced curricular materials and teaching techniques would be identified and made available to educators everywhere.

> However, this ideal flow of information and experience from one teacher to another, from one project to another, from one section of the country to another, has not occurred. Today, after nearly four years of experience, there is no source that can tell one what specifically has been produced in these projects, what specific curriculum materials and teaching techniques are worth preserving and worth making available to others. There is no report on which environmental education projects have been successful, which not, and why.
>
> In fiscal 1970, primary responsibility for the administration of the Title III program will pass from the U.S. Office of Education to the fifty states. The lack of evaluation and dissemination which has plagued environmental education projects to date will be compounded if no system is created for bringing together, analyzing, collating, digesting, interpreting and disseminating materials and methods that will be produced.

In addition to Title III curriculum materials there are other excellent materials which should be gathered and evaluated. For example: *People and Their Environment, A New Concept in Conservation Education*, was produced by the South Carolina Department of Education in cooperation with Dr. Matthew J. Brennan and Dr. Paul F. Brandwein of the Pinchot Institute for Conservation Studies; *Education for Survival, A Conservation Curriculum for Grades 1–3*, was developed by the Madison New Jersey Public Schools in cooperation with the North Jersey Conservation Foundation; the Education Development Center, Cambridge, Massachusetts, has produced a social science oriented curriculum entitled *Man: A Course of Study*; and the Madison Township, N.J. school district has developed a K–6 course of study which emphasizes the areas of science, language arts, health and art.

I recommend that H.R. 14753 incorporate a provision for a central coordinating unit, somewhere to serve as a clearinghouse. In fact, I would go further and call for the establishment of such a clearinghouse from funds which might, even now, be available to the U.S. Commissioner of Education in the newly enacted Elementary and Secondary Education Act amendments which provide the Commissioner with 15% of the total appropriation to be used at his discretion, or from other funds available under Title III.

2. Pilot Projects called for in the Act (page 3, lines 6, 7, 8, 9) might not be the same type funded through Title III ESEA. My concern is that we don't repeat the same process of funding almost identical projects. If we can achieve what has been suggested in (1) above, it would be logical then to fund projects to test the curriculum materials in a variety of selected situations throughout the country. This applies to elementary, secondary, adult, college and university, and community action curriculum materials.

3. Evaluation of the effectiveness of curriculums is indicated (page 3, lines 14, 15, 16, 17, 18, 19). I recommend State Departments of Education be included as possible contract agents. My reason for requesting that this be spelled out is my concern about college and university involvement. As things stand now, it is difficult for higher education personnel to identify with environmental education—it is outside the main stream of the higher education heirarchy—it is outside of the accepted "reward system" for promotion and salary adjustment. Unless the college community recognizes the importance of the task required to erase environmental illiteracy at all levels it would appear to me that little help will be forthcoming from this section.

4. The grants and projects required to carry out all of the items indicated on page 3 and page 4 (line 1 to 10) will have to placed in some order of priority. All are necessary. Perhaps assigning percentages of appropriations to each item will achieve this. You might consider this percentage allocation:

	Percent
Page 3, lines:	
3 to 5	10
6 to 9	10
10 to 13	10
14 to 19	10
20 to 25	--
Page 4, lines:	
1 to 3	30
4 to 7	15
8 to 10	15
Total	100

5. These specific insertions are recommended on page 3:

Line 3—and "demonstration" to be inserted between the words "development" and "of."

Line 16—"educational" to be inserted between "private" and "agencies."

Line 21—"educational" to be inserted between "private" and "organizations."

Line 25—"consultant services and follow-up activities" to be inserted between "conferences and)".

6. On pages 4 and 5 in the section defining application procedures and authority to make grants I agree with everything but suggest that on page 5 (lines 16–20) the State Departments of Education role be strengthened.

7. The need for an Advisory Committee on Educational Quality is clearly justified and well defined. (pages 6–7)

8. Technical assistance from other local, state, and federal agencies will be a must if this Act is to achieve its objectives. It would strengthen this Act if each state was requested to establish a Technical Advisory Committee similar to President Nixon's Cabinet Committee on Environmental Quality or his Council on Environmental Quality.

In New Jersey a *Master Plan for Environmental Education* has been presented to the N.J. Commissioner on Education, Dr. Carl L. Marburger. It calls for the establishment of such a committee. Dr. Marburger is in the process of establishing a Technical Advisory Committee and is implementing the *Master Plan*. This plan includes a proposed Environmental Quality Education Act which we anticipate will be considered by the New Jersey legislature. Mr. Brademas, I request permission to include a copy of the Master Plan as an appendix to my testimony.

9. I have a concern about funding. After witnessing the dropout of Title III projects after Federal support expired I would recommend that this Act include a plan for a graduated local or State support base over a five year funding period—graduated from 100% Federal support to an 80%, 60%, 40%, 20% Federal support base in each ensuing year.

10. Whenever this nation is faced with a crisis there has always emerged a national center charged with the responsibility of leading the nation through its critical perid. I think we are in an environmental education crisis period and recommend this Act include a provision for establishing a National Center on Environmental Education as an independent agency or as a sub-division of the National Institute on Education which President Nixon recommended in his March 3, 1970 speech entitled, "American Education Message from the President." This Center should be staffed to:

(*a*) serve as a national clearinghouse;

(*b*) review and edit curriculum materials being developed throughout the country and prepare this for inclusion into the ERIC system;

(*c*) work with industry, labor, volunteer organization, community action groups, government agencies in opening up communications among all of these independent groups;

(*d*) produce teacher training films for national use;

(*e*) develop other multi-media materials—films, TV tapes, cassettes, displays, teaching kits, and suggest new technology for improved teaching in the field of environmental education;

(*f*) provide the U.S. Office of Education with a continuous assessment and planning unit regarding needs, trends and programs in this vital area;

(*g*) establish a dissemination capability including work with mass-media in the production of TV presentations, news stories, and, in general, improve communications;

(*h*) design and field test new programs utilizing a multi-disciplinary approach to environmental education;

(*i*) develop curriculum models for general adult audiences, community planners, public officials and members of the business and industrial community;

(*j*) refine present evaluation methods and instruments already available and develop new ones;

(*k*) provide teacher training in environmental education utilizing established outdoor laboratories and field-tested K–12 programs.

Such a Center could operate one or more regional curriculum laboratories and serve as the coordinating agency for all efforts in environmental education.

Again, let me express my appreciation to this committee for providing me the opportunity to testify in support of the "Environmental Quality Education Act".

PROPOSAL—A STATE MODEL ENVIRONMENTAL EDUCATION PROGRAM FOR REGION II U.S.O.E.

CHAPTER I—IN PURSUIT OF CHANGE

Noxious air—contaminated waters—ravished landscapes—the geometrical accretion of wastes—dying, anachronistic cities that no longer serve man humanely—are the unanticipated consequences flowing from a way of life that has been praised as the "good life." Ironically, these consequences, in all their magnitude fundamentally deny the value and dignity of man and life. The situation borders on the brink of disaster. It also borders on the brink of hope for a new beginning, for many now realize the interdependence of human communities with the broader community of life and resources—the environment. There is a desire for significant change through the development of constructive alternatives. The need for a more panoramic and integrated view and expression of individual lives and social organization is rapidly becoming part of our collective consciousness.

We have seen within a few short years the evolution of the old "conservation" with its parochial emphases into an overriding social concern for the restoration and preservation of man and the environment. The problem has taken on new form, as well as new magnitude. The effluents from an earlier milltown factory are insignificant when compared to the massive contamination of life and resources in modern, congested urban regions. Even this latter reality of daily life for millions of Americans is miniscule compared to the global contamination of life, land, air, and water by mankind's misuse of his life sustaining earth.

Initial responses to the problem have been quickly forthcoming, but they have followed unimaginative old patterns: layers of legislation were added; crash programs were instituted with a maximum of publicity and a minimum of appropriated funding: existing governmental agencies were renamed and reshuffled—but while these responses have raised public hope for a better environment, they have failed to correct or even keep pace with the ever accelerating problem.

What is becoming increasingly obvious is that the environmental problems and their solutions are complex—that they are deeply rooted in the social, economic, political, and psychological fabric of modern life. The previous searches for big name polluters has given way to the realization that each of us through our participation in and consent to various structures, values and activities in society are the most consistently high grade polluters that ever existed.

Therefore, each will be challenged to contribute to the abatement of environmental problems. The social structures and agencies of our system are and will continue to be challenged to assert leadership and to act as agents of positive change.

Since the problems are so complex and interrelated, it follows that the solutions should be interrelated. New patterns of cooperation and action are needed to improve the quality of the environment. The largest institutions—government, education and business, must have impact in bringing about the acquisition and utilization of resources, ideas, and personnel in new, more effective ways.

If any phenomenon can be said to be characteristic of intergovernmental relations in our age, it has been the uninterrupted flow of power and responsibility from the cities and States to the Federal government. Desirable as this trend may have been under the exigencies of a depression and major world wars, searching studies recently initiated by the Congress and the Administration cogently reveal that the Federal structure lacks the flexibility and responsiveness necessary to deal with the interrelated problems and needs of a large and diversified society. Documented examples from these studies show that functional bureaucracies, operating under a narrow mandate, often ignore the broader intergovernmental and environmental implications of their programs; and that the Federal grant-in-aid system, designed to attack individual, isolated problems, often creates a more permanent and pervasive problem by undermining the levels of government closest to the people and their daily life.

As a result, a new pluralism, a new decentralization, a new willingness to experiment with open-ended and creative forms of intergovernmental programs and grant structures is being called for.

The evolution of this proposal and the program it envisages is in many ways a beginning of a new pattern and process of joint governmental and interinstitutional action on widely shared problems. While the historical development of this proposal will be discussed in length in the next chapter, what has essentially occurred is that representatives from Federal, State and local education offices have cooperatively planned a program which will permit the achievement of national goals in a regional context and make optimum use of the full spectrum of experience and operating capabilities of public and private organizations at the State and local levels. The result will be proof that the existing resources of public and private life can be fused into vigorous, new, imaginative arrangements to respond effectively to the critical challenges of a pluralistic, yet interdependent society.

CHAPTER II—NEW JERSEY RESOURCES AND FACILITIES

Beyond question, New Jersey is the ideal location for a regional model demonstration program and laboratory in environmental education. Having 941.8 people per square mile, it is the most densely populated state in the Union. The northeastern section of the state is geographically the center of a population density of 15 million people living within a radius of 60 miles and including parts of New Jersey, New York, Connecticut, and Pennsylvania. In addition to being the most urbanized state in the country, it is also the most industrialized. Because of these two factors New Jersey can aptly be termed a microcosm of the present and future problems facing the entire nation.

Furthermore, New Jersey has shown national leadership in the field of environmental ecological education and is able to provide a network of qualified environmental educators, established teaching and training facilities, and diverse learning environments. Finally, the state has unique and comprehensive representation of those powerful vectors of potential change, viz. business and industry, for within its borders lie a spectrum of these interests ranging from farming and extractive mining, space research and development, to the refining of fossil fuels.

In this setting, it is imperative that the state mount a viable program of environmental education. To this end, the State Department of Education has developed, during the past three years, a *New Jersey Plan for Environmental Education* (appendix 1).

Knowing that New Jersey must move ahead, the State Commissioner of Education, Dr. Carl L. Marburger, has endorsed the *Plan*. If the *Plan* is implemented, it can serve as a model for the other states and particularly for Region II of the United States Office of Education. On March 25, 1970 Dr. Marburger proposed, in a letter to Dr. James E. Allen, Jr., U.S. Commissioner of Education, that New Jersey serve as a *National* Center for Environmental Education. In recent meetings with personel in Dr. Allen's office it has been determined that one state in each of the ten regions established by the U.S.O.E. might develop a model program for its particular region. Therefore, it is proposed that New Jersey be established as the demonstration model state for Region II. Dr. Marburger's letter (appendix II) developed the rationale for this proposal.

For more than twenty years New Jersey has assumed a leadership role in conservation/outdor environmental education. In 1949 it established the New Jersey State School of Conservation which has since served as a teacher education and demonstration center for programs related to conservation and environmental education. All of the state colleges have required their students to attend the New Jersey State School of Conservation for one week during their undergraduate program of studies. This winterized resident facility houses approximately 250 college, elementary and secondary students each week and has a competent staff.

Rutgers—The State University, through its recently reorganized college of Environmental Science has stressed research and specialized undergraduate and graduate study in addition to conducting in-service workshops for teachers.

Three of the state colleges, funded with over one-half million dollars under the NDEA, have developed Master of Arts degree programs in environmental education.

Since 1966, with approximately two million dollars available through Title III ESEA, four additional facilities have been established. A brief description of each follows:

New Jersey State Council for Environmental Education, 355 Route 46, Mountain Lakes, New Jersey 07046. Director: Dr. Edward J. Ambry Phone: 201 627-8240.

A statewide planning and research project in Environmental Education, the Council operates under a grant to the Newark, New Jersey Board of Education. It was designed to (1) assess Title III Environmental Education projects in New Jersey, (2) inventory all Environmental Education programs and sites within the state, (3) determine how inner-city youth may best be served by Environmental Education, (4) create an awareness of the value of Environmental Education within the general public, (5) develop an evaluation instrument for Environmental Education programs, and (6) design a statewide Master Plan for Environmental Education. All of these objectives have been realized. Since it is composed of a Board of Directors representing thirteen interest groups in the state, including professional educators as well as state governmental department representatives, the Council has a wide scope of interests which make it sensitive to divergent viewpoints and enables it to respond quickly to New Jersey's educational needs. The Council also maintains communication among the other Title II Environmental Education projects, two hundred local school district environmental education programs and local conservation interest groups in the state.

The Conservation and Environmental Science Center, Box 2230, R. D. #2, Browns Mills, New Jersey 08015. Director: Dr. V. Eugene Vivian. Phone: 609 893-9151.

The Center, sponsored by the Glassboro, New Jersey school district, conducts on-school-site, day, resident and teacher in-service programs on the site of an abandoned cranberry bog. The discovery approach to learning is a basic factor underlying all Center programs. Learning experiences and a series of curriculum guides have been developed for primary, intermediate, upper elementary, junior high and secondary grade levels in the areas of mathematics, art, science, social studies and language arts. A major objective of the Center is to promote an alliance of local industry, education, and state and federal governments in order to study environmental problems in depth and disseminate results of those studies to the citizens of New Jersey.

Science Interpretive Center (Shore and Marine Environmental Program), Sandy Hook State Park, Box 57, Atlantic Highlands, New Jersey 07732. Director: Mr. J. Ronald Gardella 201: 291-1481.

This center is sponsored by the Middletown Township School System and is available to all elementary and secondary students of Middletown Township and to students of Brookdale Community College. The program seeks to enrich learning by making maximum use of the marine environment at Sandy Hook. Although most of the offerings at the Interpretive Center are science oriented, provisions are made for language arts, mathematics, art and social studies as well. The science offerings, which make use of the natural history of Sandy Hook, include geology, land and marine biology, ecology and pollution. Ample modern laboratory equipment, developed field programs, a well-qualified staff, and wilderness study areas—including salt marshes, ocean-bay estuaries and a holly forest—insure a rich student experience. A self-guided trail for handicapped children is presently being developed.

Stepping Stone Environmental Education Center, R. D. #2, Box 270, Branchville, New Jersey. Director: Mr. Donald S. Calderon 201: 948-3141.

Located on 28 acres of state land within Stokes State Forest, Stepping Stone Environmental Education Center is sponsored by the Carteret, New Jersey School district and operates both resident and day use programs throughout the school year. The program is both multisensory and interdisciplinary, involving the students actively in the subject matter through exposure to real life situations. Teachers are supplied with worksheets and supplementary curriculum material. The staff also conducts on-school-site studies, carried out at the request of the individual school districts, as well as inter and intradistrict teacher training workshops and in-service programs.

Several other facilities are available in New Jersey to afford a diversity of programs.

The Thunder Mountain Camp in the Tocks Island National Recreational Area will be utilized by the Newton Board of Education for special vocational education and recreation programs. This facility will also be available for use on a subscription basis by other school districts.

The Trenton Action Bound School within a School Program, originally funded under Title III, is now operating on an expanded financial base, including support from its three neighboring districts of Lawrence Township, Ewing Township, and Hamilton Township; Lawrenceville Preparatory School (private) and from the Ford Foundation. A regional Environmental Education program is being developed based on the objectives of the Action Bound program viz. increasing the self confidence, self understanding, community understanding and academic achievement of gifted but underachieving male secondary students through the integration of motivational classroom devices with high anxiety problem centered Outward Bound types of experiences.

The Union County Environmental Education Center, originally funded under Title III through the Linden Board of Education, has recently come under the aegis of the Union County Educational Services Commission and is supported by direct school district funding from seventeen of the twenty-one Union County districts. The Center is located on a 2000 acre tract of land and can accommodate pupils on a daily basis.

Of these facilities described, all except the Trenton Project, are located on state or county owned land. Classroom facilities, outdoor teaching stations, research facilities, and demonstration teaching areas have been partially developed. Stepping Stone Environmental Education Center has winterized resident facilities for seventy-five people, while the other centers can accommodate students on a day-to-day basis. All of these facilities will need further development in order to become functional sub centers of a statewide environmental ecological education model program.

Environmental Ecological Education probably does not exist now in any school district as a mandated K–12 curriculum effort. However, over one-third of the school districts in New Jersey have incorporated some type of environmental studies into the curricula of one or more grade levels. There is considerable variation of objectives, implementation and programming among the districts. Of particular note are recent developments among certain districts regarding curriculum revisions. The Madison, New Jersey, district has developed, in cooperation with the North Jersey Conservation Foundation, an Environmental Ecological Education (Education for Survival) curriculum for grades 1–3 which will be totally implemented in September 1970. At the same time, the East Windsor school district will be incorporating an ecologically oriented curriculum in grades K–8. The Madison Township school district, which also houses a Title III program in Environmental Education, has developed and is using a K–12 environmental education curriculum, which is supplemented by an outdoor studies center, a mobile lab and related environmental materials. A series of units dealing with thermal pollution, air pollution, and other environmental topics was produced by the Union Public School district. The first unit, designed for fourth grade level, includes film strips, videotapes, a 16mm film loop, demonstration devices, a teachers' manual and lesson plans. This unit will be introduced into the curriculum in several public and parochial schools in Union in September 1970. A grant of approximately $60,000 from Title III, ESEA, will be devoted to testing this first unit and producing additional units at a variety of grade levels.

The twenty-one County Park Commissions are well aware of the need to relate their respective programs and facilities to school, college, and adult environmental education efforts. Four Counties (Essex, Passaic, Morris and Monmouth) have constructed centers and are engaged in active programs, while a fifth (Somerset) has planned and is currently in the process of developing a center.

County Agriculture Agents, Soil Conservation districts and the newly announced State Department of Environmental Protection are all discussing ways and means of gearing up to assist in a massive statewide effort to develop a literate citizenry in environmental awareness and action.

Eleven Community Colleges have been launched during the past few years and several others are on the drawing boards. The Community College in Monmouth County (Brookdale Community College) has employed staff and is currently planning an expansive environmental education program as a demonstration for the other colleges. This college will use its own facilities, the Science Interpretive Center at Sandy Hook, and many other Federal, State, County and private facilities in the programs it has planned to initiate in September 1970.

Governor William T. Cahill has placed a high priority for his administration to be engaged in activities which will lead to the solution of the State's multitude of environmental problems. The new Department of Environmental Protection, the Governor's many speeches, and his recent letter to President Richard M. Nixon are all indications of his interest to pursue an active role in the pursuit of environmental quality for New Jersey. Attached to this proposal (as appendix III) is a copy of A 1092, a piece of legislation introduced into the New Jersey Assembly on May 12, 1970. This legislation was developed by the New Jersey State Council for Environmental Education and is attached to the New Jersey *Master Plan* (appendix I) in its proposed form.

To fully develop the potential of all the segments of this comprehensive network of agencies and facilities in terms of the long and short range objectives described in Chapter III will necessitate an infusion of federal financial assistance. Other sections of this proposal describe the financial status and requirements for support which will allow New Jersey to forge ahead and to serve as an exemplary model for Region II and for the rest of the country.

CHAPTER III—OBJECTIVES

The intent of the proposed New Jersey Environmental Education Model Center of Region II, U.S. Office of Education is to contribute to the following national goals:[1]

1. "Fulfill the responsibilities of each generation as trustees of the environment of succeeding generations.
2. Assure for all Americans safe, healthful, productive and esthetically and culturally pleasing surroundings.
3. Attain the widest range of beneficial uses of the environment without degradation of health or safety or other undesirable or unintended consequences.
4. To preserve historic, cultural and natural aspects of our national heritage and maintain whenever possible an environment which supports diversity and variety of individual choice.
5. Achieve a balance between population and resources which will permit high standards of living and wide sharing of life amenities.
6. Enhance the quality of renewable resources and approach the maximum attainable recycling of depletable resources."

It is felt that the focus of the New Jersey objectives, which contribute to the achievement of national goals, is as follows:[2]

To enable industry, education, government, other groups and individuals to work cooperatively, and to pool their resources in:

I. Creating environmentally literate citizens who:
    (*a*) Understand their interdependence with the environment
    (*b*) Accept responsibility for environment
    (*c*) Are knowledgeable of environmental problem
    (*d*) Actively participate in the solution of environmental problems
    (*e*) Contribute to prevention of future environmental problems
II. Increasing the usage and diversity of educating environments
III. Providing leadership for research and development, professional and nonprofessional training, and curriculum change
IV. Development of a procedure for the permanent coordination of the educational activities of public and private organizations, agencies, groups and individuals.

To achieve these objectives, the proposed plan will be implemented through three components: a Technical Advisory Committee; an Environmental Education Model Center; and a structure of Operational Models. The objectives of each component are diagrammed here over a three year time line.

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[1] From: P.L. 91–190 [National Environmental Policy Act of 1969].

[2] Appendix I Master Plan Page 3 and 4.

TECHNICAL ADVISORY COMMITTEE

1st year	2d year	3d year
To structure a committee that would include representatives from—[1]	To maintain a representative group from—	To continue—
various branches of State and local government, public and private universities, colleges, and schools, student organizations, citizen service organizations, business, labor and industry, professional associations, the media and others:		
To build communications between groups through representatives on the Technical Advisory Committee.	To maintain communications	To continue.
To acquire vital information on the environment and its problems.	do	Do.
To review and organize this information as a basis for decisionmaking.	do	Do.
To assess the capabilities of available resources, personnel, and technology.	do	Do.
To assess all forms of ongoing educational activities which relate to environmental quality.	do	Do.
To develop a course of action for statewide implementation.	do	Do.
To recommend a course of action for statewide implementation.	To review and revise the statewide course of action based on feedback and new information.	Do.
To provide liaison with other States in region II	do	Do.

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[1] App. I, master plan, pp. 6 and 7.

ENVIRONMENTAL EDUCATION MODEL CENTER

1st year	2d year	3d year
I. To develop structures, strategies, and objectives in order to—		
(a) Create and fill positions with leaders who have the ability to focus on, plan for, and implement short-range as well as long-range programs.	Same	Same.
(b) To coordinate the implementation of environmental programs.	To continue implementation	Do.
II. To facilitate the creation and administration of appropriate programs which will contribute to—		
(a) Training:		
1. Professional and post secondary (a) Undergraduate. (b) Graduate. (c) Continuing.	To produce environmentally literate citizens and trained professionals.	Do.
2. Nonprofessional (a) Technicians. (b) Paraprofessionals. (c) Others.	To produce technicians and other nonprofessionals capable of acquiring employment in ecologically related fields.	Do.
(b) Environmental research and development	To publish and communicate findings.	To report findings to appropriate publics.
1. Community services 2. Education materials. 3. Teacher training. 4. Vocational services. 5. Communications.	To plan and conduct additional research activities based upon findings.	To continue research.
(c) Curriculum development and evaluation 1. Elementary. 2. Secondary.	To create pilot studies to evaluate the effectiveness of materials and curriculum.	Same.
3. Postsecondary 4. Special education.	To encourage implementation of curricular materials.	Do.
5. Vocational education. 6. Public education.	To make such modifications in curriculum as deemed necessary by evaluation.	Do.
	To make materials available to interested public.	Do.
III. Act as a clearinghouse for information:		
(a) Gather information (b) Evaluate. (c) Dissiminate.	Same	Do.
IV. Function as staff for technical advisory committee	do	Do.
V. To provide liason with other States in region II	do	Do.

OPERATIONAL MODELS AND SUBCENTERS

To develop structures, strategies, and objectives in order to work cooperatively with subcenters in providing— 1. Models of environmental programs. 2. Field sites for pilot programs for new curriculums. 3. Such services in training, monitoring, and demonstration deemed appropriate by subcenters. 4. Local focuses for community efforts and programs in environmental endeavors. 5. Ways and means for exchange and dissemination of information.	To continue development	Same.

CHAPTER IV—A COOPERATIVE EFFORT

If environmental ecological education is to be the education for the survival of the United States and the World community, it must be developed in all sectors of the population. This chapter deals with the total effort needed to expand present isolated programs into a statewide matrix which will serve the needs of New Jersey and also serve as a model program for Region II, U.S.O.E., and the Nation.

To achieve the objectives outlined in Chapter III, a model program will be developed to carry out the necessary research, development, and implementation of a variety of activities providing for a unified, coordinated, viable design for change from the status quo to an acceptable program of action which will produce the desired changes in attitude, and use of the environment, as well as provide a worthy heritage for future generations.

The appointment of a high level, broadly representative Technical Advisory Committee which will serve, in a sense, as a board of directors for the model center is the key to the entire enterprise. This committee will be the vehicle through which communications will be expanded and will allow for an open exchange of problems confronting many sectors of government, industry, and education.

Legal problems, factual studies, long-range plans, projections for future development, economic forecasts and the wide range of information necessary for decision making are produced by agencies and groups represented on the Committee.

A major task of the Technical Advisory Committee and the staff of the Model Center will be the pooling of information, its evaluation and subsequent conversion to courses of study. These courses of study and adjunct curriculum materials will be disseminated and made available to public and private schools, institutions of higher education, public seminars, and news media. The Center will also provide curriculum models and materials for industrial, business and intragovernmental technical training sessions.

Teaching materials and training devices are being developed and tested throughout the country. The Center will collect, for its reference library, much of the material developed by governmental agencies, industry, Title III projects, local, country and state school departments. The staff and consultants will evaluate this material and disseminate their findings to appropriate audiences. As a clearinghouse, the Center will carry a heavy responsibility for dissemination.

The Center will sponsor leadership training seminars for business, government and school administrators, teachers, community groups, environmental-interest organizations and associations and others. These programs may be conducted at the Center or by contractual arrangement at one of the sub centers, industrial training facility, college or university.

Exchange of information with other states and territories in Region II will be accomplished through conferences, newsletters, staff exchange, fellowship training programs and dissemination of model curriculum materials and media.

The Center will designate several of the sub-centers to achieve particular objectives. Two sub-centers, which presently conduct in-service teacher training environmental ecological education programs, will be designated as the extension facility to plan and conduct a series of workshops, seminars and training sessions. Other sub-centers will be identified as curriculum development and testing stations, working in cooperation with the staffs of the Model Center and the other sub-centers to allow for maximum communication, evaluation and implementation.

Community College Manpower training programs will be developed as part of the total state plan with the Center serving as a coordinating and dissemination facility.

The above major thrusts of the Technical Advisory Committee through the Center staff and the network of sub-centers will be organized to meet the common and specific environmental needs of various sectors of society. Although a broad discussion of these needs appears on pages 11 through 20 of the New Jersey Master Plan for Environmental Education (appendix 1), the following is offered as a brief list of the major sectors of concern together with their more critical individual requirements.

General public needed—

Public forums on current environmental problems of community, state and nation.

Local radio and television programs that educate, not titillate.

Informative news journalism.

Environmental ecological training sessions and conferences for journalists, television producers, radio programmers and other media specialists.

A central source of reliable information on environmental issues and programs.

An awareness on the part of the general public that it can and must effectively act regarding environmental issues.

Business and industry needed—

A viable working relationship and creative exchange between business/industry and education.

Translation of industry's data, planning and technology into relevant curriculum materials.

Preparation and training of environmental ecological specialists for business and industry.

Conferences, seminars, and symposia on environmental affairs for all levels of management.

Elementary and secondary education needed—

Teachers, school administrators, and school board members who understand the societal significance of environmental ecological education.

In-service training programs and facilities which will offer teachers exposure and practice with experimental ecological curriculum materials, teaching aids, instructional techniques, and educating environments, other than the classroom and school building.

Curriculum materials which are attractive to teachers because they are relevant and immediately adaptable to existing curricula and are attractive to students because they are relevant and replete with direct, often self-guiding learning experiences.

Vocational high school training in environmentally related occupations.

A central servicing agency able to provide environmental ecological information, consultation, curriculum materials and multi-media teaching aids.

Higher education needed—

A well organized and stimulating required environmental ecological studies course for each college student.

New interdisciplinary majors at the undergraduate and graduate levels.

Expansion of independent studies programs and encouragement of individual projects related to environmental quality.

Environmental technician training for students of two year community colleges.

Continuing education and refresher courses on environmental issues and processes for graduates working in the fields of business, engineering, law, medicine, government, etc.

Conferences, seminars and symposia on environment for diverse groups of faculty members to facilitate the exchange of ideas and to sensitize these key individuals.

Adult education needed—

Survey-type and specific course offerings on environmental subjects.

Preparation of adult educators to teach such courses.

Use of local community business leaders, environmental specialists, and governmental officials as educational resources.

Development of more sophisticated curriculum materials and teaching aids for adult level courses.

Active involvement of the adult sector of a community in its local environmental problems to effectuate change.

Governmental agencies needed—

Active leadership and cooperation of governmental agencies, industry, business and education to insure environmental quality.

Astute planning and development and management of open unused property.

Seminars and conferences to disseminate basic ecological knowledge which relates to the impact of various technologies on environmental quality.

Interagency cooperation with other sectors of the population in the development and conversion of source materials to viable curriculum.

A SUMMARY OF ACTIVITIES TO BE ACHIEVED

Appointment and maintain the Technical Advisory Committee.

Select and appoint staff.

Recommend and implement operationa lfunctions.

Work with industry, governmental agencies, educators, community action groups, other groups and individuals in Region II to open up new and productive channels of cooperation and communication.

Provide a continuous flow of information through Region II to the U.S. Office of Education and other regions.

Encourage industrial and university research in developing technology which will insure environmental quality.

Serve as an environmental ecological clearinghouse for Region II.

Develop and maintain a management and communications system.

Assemble, review, edit, and disseminate ideas and curriculum materials.

Design and field test new programs.

Develop a library of resource materials.

Produce teaching aids and other multi-media materials—films, charts, TV tapes, film loops—and explore new technologies for improved instruction.

Serve as liaison to attract governmental agencies, business/industry personnel to assist in course instruction and in the preparation of source materials.

Provide teacher training in environmental ecological education utilizing established outdoor laboratories.

Involve persons from interest groups as resource and paraprofessional assistants in the ongoing programs in schools.

Institute environmental technician training courses and provide a placement service for trained technicians.

Provide programs for the development of faculties of educational institutions.

Conduct workshops, seminars, forums and in-service training sessions on the environment.

Develop curriculum models for general adult audiences, community planners, public officials, and members of industrial, business, and governmental communities.

Initiate contractual arrangements for services with other agencies.

Refine present evaluation materials and instruments; develop new systems analysis evaluation techniques.

CHAPTER V—MANPOWER TRAINING FOR ENTRY POSITIONS RELATED TO THE ENVIRONMENT

The need for a training program for paraprofessionals to embark upon careers in occupations related to environmental quality control, resource conservation, and allied health services is demonstrated by the increasing number of agencies and industries charged with or assuming responsibility for monitoring the impact man has had and is having on the total environment.

The logical institutions to mount training programs for the ever increasing occupations related to environmental control are the community colleges and secondary and post-secondary, vocational-technical institutes. Some programs are being offered, but many more need to be launched.

There is a need for faculty development, creation of curriculum materials and an examination of teaching techniques.

As pilot programs are developed and operated there will be a need to share information and create a communication system for dissemination to other New Jersey institutions and institutions in the states and territories served by Region II, U.S. Office of Education.

Brookdale Community College in Monmouth County and Essex Community College in Essex County have been selected to initiate programs and serve as pilot sub-centers of the New Jersey Model Center for Environmental Education.

At Brookdale, programs will be offered to meet demands for Marine Engine Mechanics, Boat Maintenance Technicians, Inhalation Therapy Technicians, and Hospital Aides. Essex Community College will offer programs for Allied Health Technicians, Scientific (Chemical and Biological) Technology Technicians, Urban Social Services Technicians, and Public Administration Technicians.

During the academic year 1970–71 these two colleges will prepare 408 trainees to be selected from a potential manpower pool of underprivileged, undereducated, unemployed, and underemployed residents of urban Essex County and semi-urban Monmouth County. Administrative and counseling services will be provided by the Colleges in cooperation with local State employment agencies and available County and State service agencies.

The proposed training programs and budgets are attached to this proposal as Appendix IV and Appendix V.

Many of the teaching techniques, curriculum materials and media required for these programs will have application in other educational endeavors.

Through the Technical Advisory Committee and the Model State Center, numerous opportunities will be provided to share, exchange and to evaluate the programs. The broad representation on the Technical Advisory Committee will allow for immediate survey of employment possibilities and on-the-job follow-up of trainees after placement.

The two New Jersey Community Colleges, in consort with other community colleges representing each of the other nine U.S.O.E. regions and under the lead-rship of Miami-Dade Community College, Floirda, are developing a network of communication systems which will result in wide spread dissemination. The total effort will serve as a model of cooperative and innovative attempts to open up communications which before this time have not been possible.

CHAPTER VI.—BUDGET, JULY 1, 1970, TO JUNE 30, 1971

	New Jersey appropriation or pledged	In-kind services and resources	Requested
Technical advisory committee (meetings, consultative services, interstate communications)	$15,000	$25,000	$20,000
Model center (operations):			
Professional staff (13)	49,000	10,000	150,000
Clerical staff (3)	5,000		12,000
Bookkeeper-manager	2,000	1,000	8,000
Office material and supplies	2,000		6,000
Facilities and maintenance	3,500	30,000	30,000
Phone and communication	2,000	500	10,000
Capital (equipment)	2,000	5,000	4,000
Travel	6,000		20,000
Consultants	1,000	3,500	6,000
Fringe benefits (25 percent of salaries)	14,000		42,500
Model center (programs):			
Conferences and training	5,000	5,000	200,000
Curriculum (review pilot, followup)	10,000	5,000	50,000
Media production	5,000	220,000	700,000
Service to manpower training programs		5,000	100,000
Research and development	3,500	10,000	700,000
Subcenters:			
Contracted services:			
Stepping Stone E. E. Center	45,000	25,000	60,000
Cons. and Env. Science Center	235,000	100,000	100,000
Science Interpretive Center		20,000	40,000
Others	1,350,000	100,000	100,000
Equipment and physical plant:			
Stepping Stone E. E. Center		250,000	500,000
Conv. and Env. Science Center		3,000,000	1,500,000
Science Interpretive Center		125,000	50,000
Others		2,000,000	150,000
Manpower training		1,779,560	2,215,000
Total	1,755,000	7,719,560	6,773,500

APPENDIX I.—MASTER PLAN FOR ENVIRONMENTAL EDUCATION

A PROPOSAL FOR NEW JERSEY

The New Jersey State Council for Environmental Education, funded through the Elementary and Secondary Education Act of 1965, is administered by the Newark, New Jersey, Board of Education. Established in September, 1967, the Council was formed to achieve the following six objectives:

1. Develop an evaluation instrument for Environmental Education Programs.
2. Inventory all Environmental and Outdoor Education programs and sites in New Jersey.

3. Assess existing Title III projects in Environmental and Outdoor Education.
4. Determine whether inner city youth are being served.
5. Increase public awareness of the value of Environmental Education.
6. Develop a Master Plan for Environmental Education in New Jersey.

Representatives from the following state agencies and other organizations concerned with environmental education are constituted as the Board of Directors:

State Department of Agriculture
State Department of Community Affairs
State Department of Conservation & Economic Development
State Department of Education
State Department of Higher Education
State School of Conservation
N.J. Section of the American Camping Association
Public School Superintendents
State Colleges of New Jersey
Newark Public Schools
Title III Projects
Private-Parochial Schools
New Jersey Association for Environmental Education
U.S. Office of Education
Members at Large

A staff of five (three professional and two secretarial) is employed to carry out the activities of the Council.

THE ENVIRONMENTAL IMPERATIVE

Concern for the environment of man has become a dominant socal issue of our time. The problem is no longer definable in the traditional terms of conservation or natural resources. It is now the quality of man's life . . . the livability of the environment, particularly the urban environment. The challenge is as vast as an atmosphere free of cancer producing chemicals, and as small as a child joyously playing in a stream of water free of disease bacteria and poisons. It is a basic reaffirmation of man's value and dignity, and promise that the future need not be more and more of worse and worse.

Much environmental legislation has been enacted in recent years. Departments and agencies have been restructured. Unfortunately, while the resulting programs have raised hopes for a better environment, improvement which can be seen, smelled, heard or tasted has not kept pace with ever accelerating environmental deterioration.

In essence, New Jersey is faced with a double dilemma; it is both the most highly urbanized and the most industrialized state in the country. Given the recent projections for population and industrial growth, it is difficult to see how the state's already stressed air, land, and water resources will support unlimited growth. New Jersey, as a microcosm of the entire country, shows abundant evidence of environmental breakdown. In the sphere of water pollution alone, the statistics are chilling. Each day the 750 sewage treatment plants throughout the state dump more than one billion gallons of inadequately treated wastes into our major drainage basins. These and other effluents which finally move down to our coastal marshes have put a virtual end to a once thriving shellfish industry. A recent survey conducted by the United States Bureau of Sport Fisheries and Wildlife indicates that of fish and ducks sampled throughout the country, the highest DDT concentrations were found in New Jersey populations. One can only speculate whether this statistic carries over to our human population. Our state's environmental crisis is not limited to tangible pollution problems; it is also evidenced aesthetically, from disappearing green space, to web-like networks of power and utility lines, to billboard encroachment on most state and county highways.

The people are tired of the rhetoric of good intentions. While they willingly approve massive bond issues and pay higher taxes for open space acquisition and pollution abatement, they are increasingly marshalling determined and effective citizen opposition to highways, airports, and the loss of natural areas. They are being forced into positions of militancy, and leadership at every level of society is vulnerable to their righteous indignation.

The effects of this mounting environmental consciousness are predictable. Our great institutions, especially government, education, and business will be challenged to assert their leadership as agents of positive social change. They will be asked to provide constructive alternatives to the present course of society which appears inimical to life itself.

The Department of Education and Higher Education have specific interest in improving education as a force for environmental quality. Education with its institutional network throughout the state reaches the largest segment of the state's population in one place at one time. Already over 200 of our 596 school districts are actively engaged in environmental studies. Through several privately, state and federally funded supplementary education centers (more fully described in a later section of this proposal) environmentally oriented curriculum materials and teachers' guides have been prepared for many discipline areas and age groups. Much more remains to be accomplished, however.

To be effective, to be relevant, education must be able to enlist the resources of industry, of government, of the private sector. In curriculum development alone if education could obtain and translate into instructional materials the studies, plans, maps, laws, and legislation of the preceding groups, the result in the elementary classroom or the adult education lecture would be revolutionary. Students would be able to deal with the real problems and issues of their state and community, and the school as an artificial institution not within life but self-contained in its own world would cease to exist. It is in response to this growing challenge that the master plan was written.

The master plan is an evolutionary document. Its antecedents are those exceptional teachers and school systems of New Jersey which have already enriched their curricula and students through the conscious use of the environment as a teaching vehicle. It builds on their experience, their successes and failures.

The primary objective of the master plan is to create, in the most rapid and efficient way possible, an environmentally literate citizenry—a citizenry who understand their interdependence with and responsibility for the total environment, and which possesses the knowledge and concern to solve existing problems and to prevent future ones. In the process, the master plan seeks to foster the greater use of the numerous learning environments which exist outside every textbook cover and schoolroom wall, and thereby to offer each citizen the deep satisfaction which comes from really sensing and understanding the daily flow of life around him.

The key to effecting change in educational procedures is educational leadership and commitment. In recent years the Commissioner of Education has initiated and authorized significant projects and activities related to environmental education. In view of the urgent need for immediate next steps, the New Jersey State Council for Environmental Education recommends that the Commissioner of Education review the master plan and implement its recommendations as soon as possible.

We propose: (1) establishment of a Department of Education Technical Advisory Committee on Environmental Education; (2) encouragement of local school district Concerned Citizens Committees on Environmental Education; (3) strengthening the network of Environmental Education Centers; and (4) support for the proposed legislation included in this master plan.

WHAT IS ENVIRONMENTAL EDUCATION?

"What are the specific tasks to be assigned to this new environmental/ecological education? They can be summed up briefly: awareness, concern, motivation and training:

Awareness of how we and our technology affect and are affected by our environment.

Concern for man's new and unique responsibility to re-establish and to create beneficially balanced relationships among all forms of life within the closed earth system.

Motivation and training to enable us to acquire and spread the knowledge and skills that will help us solve interrelated environmental problems and prevent their future occurrence."

JAMES E. ALLEN, JR.

"The aim of Environmental Education is to make use of the wealth of human and physical resources in every community which can reinforce and contribute to the learning process . . . to add understanding to the students' awareness of the variety and complexity of life around them . . . and, above all, to make the educational process relevant to the students needs, both immediate and future."

EDWARD J. AMBRY.

"Environmental Education seems to create a concern for all environment that leads to a commitment to preserve or develop optimum environment, and to improve less desirable environments. In addition, Environmental Education concerns itself with the learning environment; it seeks a commitment by educators to develop and utilize situations and conditions where learning can flourish."

V. EUGENE VIVIAN.

"Environmental education is aimed at producing a citizenry that is knowledgeable concerning the biophysical environment and its associated problems, aware of how to help solve these problems, and motivated to work toward their solution."

WILLIAM B. STAPP.

"Environmental Education is defined as that education which deals comprehensively with both human resources and conditions and natural resources and conditions . . . and their relation to each other—in other words, the total environment."

SOMERSET COUNTY PARK COMMISSION.

DEPARTMENTAL OF EDUCATION TECHNICAL ADVISORY COMMITTEE OF ENVIRONMENTAL EDUCATION

The threat of destruction is imminent.

All over the state, citizens are exhibiting mounting environmental consciousness.

Education can be the most effective vehicle of positive change.

Education should assume its position of leadership in articulating a course of action to effect positive change.

The cooperation of industry, labor, government, and civic groups is needed to comprehensively effectuate this change.

The time to move is now.

A Technical Advisory Committee on Environmental Education should be established with its primary mission to advise the Commissioner of Education on the implementation of a state-wide environmental education program of action.

It would serve the Commissioner of Education by gathering vital information, reviewing Education Department efforts related to environmental education, and recommending a course of action based on the master plan and other data resulting from its deliberations.

This Committee should consist of twenty members. They will be appointed by the Commissioner of Education for three year terms.

Ten members would be appointed from such groups as:

State Department of Education
State Department of Higher Education
State Department of Conservation and Economic Development
State Department of Health
State Department of Transportation
State Department of Agriculture
Rutgers—The State University
Other New Jersey Colleges and Universities
County Superintendents of Schools
School Superintendents Association
Secondary School Principals Association
Elementary School Principals Association
Classroom Teachers Association
Private and Parochial Schools
Association for Supervision and Curriculum Development
Title III Environmental Education Projects

The other ten members would be drawn from the following sources:

Parents
College Students
Secondary Students
Board of Chosen Freeholders

Federated Boards of Education
Municipal Conservation Commissions
League of Municipal Governments
County Park Commissions
Citizen Service Organizations
Private Foundations
Business
Churches
News Media
Labor and Industry
Soil Conservation Districts

The Technical Advisory Committee on Environmental Education should address itself to the following:

a. Review, with the Commissioner of Education, personnel in existing educational agencies on both the statewide and local levels and recommend effective means for their overall coordination.

b. Recommend more effective means for utilizing the personnel resources available within the educational community. (Soil conservation service, Agriculture Extension Agents, etc.)

c. Identify those personnel in the educational community who are responsible for major curriculum changes at the state and local levels.

d. Devise a means for effectively coordinating the capabilities of education agencies with those of business, civic groups and federal agencies based in the state.

e. Identify the amount and allocation of those financial resources of the state and federal government now allocated to existing environmental education centers; consider the need for new or improved fiscal arrangements.

f. Consider the establishment of additional regional environmental education centers and environmental education research and curriculum development centers throughout the state and devise appropriate legislation for their establishment and continuation.

g. Identify and assess the capabilities of other environmental resources and agencies within the state and recommend means for their coordinated utilization. For example, county park systems, municipal conservation commissions, representatives of local and county natural resource agencies.

h. Keep abreast of new sources of Federal-State financial assistance programs.

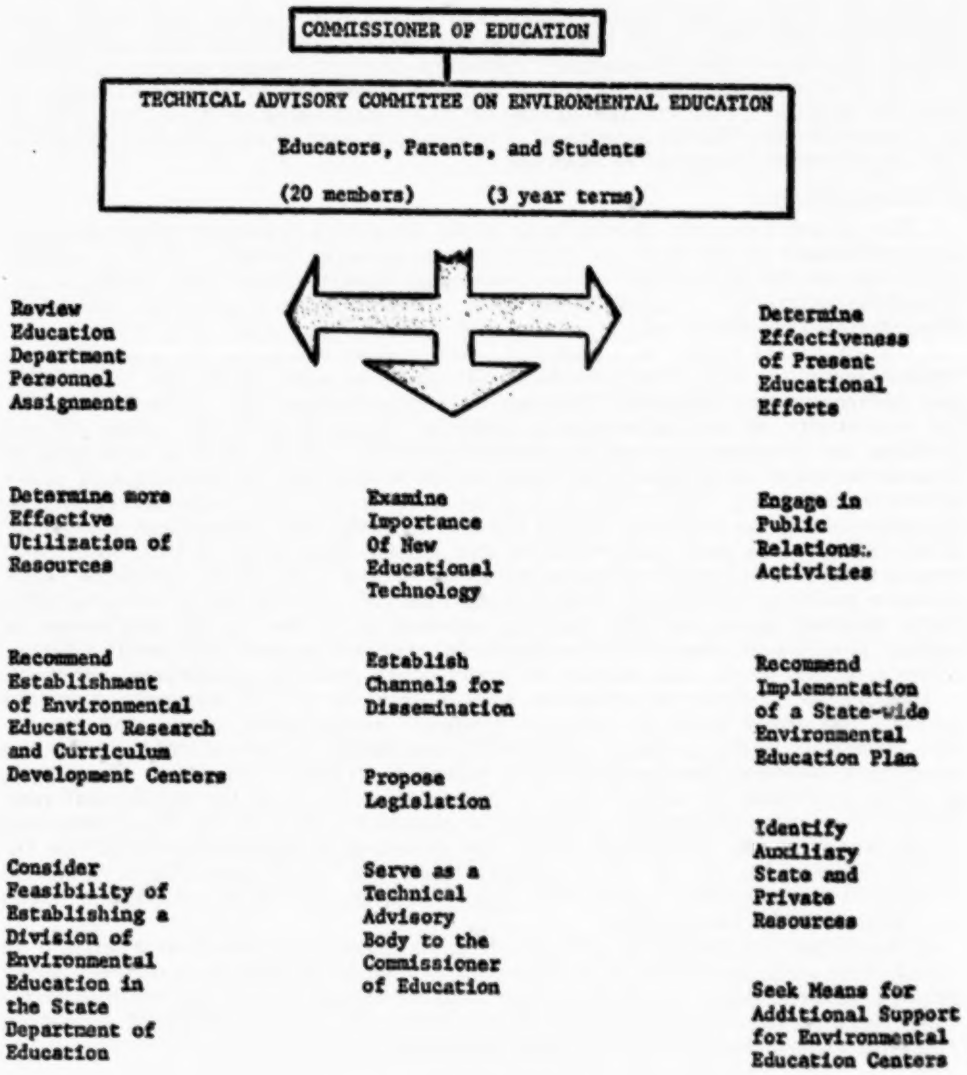
i. Review existing education programs at all levels to determine their present effectiveness and future potential for creating an environmentally literate citizenry; recommend a system to insure the constant flow of new materials into the school curricula.

j. Assess new and changing educational technologies for their potential use in environmental education programs.

k. Consider the establishment of a permanent Education Department Environmental Education Division to carry out the recommendations of the Technical Advisory Committee and the Commissioner of Education.

l. Devise a managerial plan and organizational structure for actuating a comprehensive state-wide environmental education program for all educational institutions; determine a feasible timetable for this effort.

The Technical Advisory Committee on Environmental Education should prepare reports on its findings to be submitted to the Commissioner of Education at regular intervals. (monthly or bimonthly)


COMMISSIONER OF EDUCATION
TECHNICAL ADVISORY COMMITTEE ON ENVIRONMENTAL EDUCATION
Educators, Parents, and Students
(20 members) (3 year terms)
Review Education Department Personnel Assignments
Determine Effectiveness of Present Educational Efforts
Determine more Effective Utilization of Resources
Examine Importance Of New Educational Technology
Engage in Public Relations: Activities
Recommend Establishment of Environmental Education Research and Curriculum Development Centers
Establish Channels for Dissemination
Recommend Implementation of a State-wide Environmental Education Plan
Propose Legislation
Identify Auxiliary State and Private Resources
Consider Feasibility of Establishing a Division of Environmental Education in the State Department of Education
Serve as a Technical Advisory Body to the Commissioner of Education
Seek Means for Additional Support for Environmental Education Centers

A Brief Report

ELEMENTARY AND SECONDARY EDUCATION

Discussion

To control an automobile at seventeen . . . . . to direct the course of the nation at eighteen. Had New Jersey students gained their suffrage in the last election, how well would their elementary and secondary educations have helped them to achieve the perspective and maturity expected of an adult electorate?

One fact is certain. As a group, they are acutely aware of important social issues and understand that the realities of life often are not reflected in the formal curriculum. This growing awareness of the world around them, though it has fostered student discontent, unrest, and the cliche, "relevance," is a positive social value which education must recognize and build upon. The purpose of environmental education is to do just that . . . . to make use of the wealth of resources in every community which can reinforce and contribute to the learning process . . . . to add understanding to the students' awareness of the variety and complexity of life around them.

It has been ascertained through a statewide survey, that approximately 200 of the existing 596 school districts are involved in some type of Environmental Education program. The scope and extent of these programs vary considerably among the school districts. Some programs are of an isolated type, a one-exposure approach, and usually are terminal. Others are of longer duration and incorporate many grade levels which use schoolsites, parks, local fields and woodlands, solid and liquid waste disposal plants, town meetings, newspaper stories, and many other community resources in their environmental education studies. If school students, the future voting citizens, are to become involved as effective monitors and change agents of their environment, then the schools must provide more than a peripheral acquaintance with environmental problems. The school curriculum must be modified.

Recommendations

1. The primary concern should be to make the school personnel more aware of the seriousness of current and future environmental problems and of education's role in the restoration of environmental quality. This task would be accomplished through a combination of workshops, conferences and film/slide presentations involving teachers, supervisors, administrators, and others.

2. An important aspect of a modified curriumulum would be the application of student learnings from environmental education experiences to the solution of real environmental problems. Through field experiences with problem areas in the community or region, students could be involved with the source of the problem, its consequences and its possible solution. For example, a new type of homework could be assigned in which youth would involve parents and other adults in collecting data related to a local environmental problem leading to suggestions for its solution. Young people, working with Municipal Conservations Commissions and local Planning and Health Boards could have first hand experiences not available through the usual school curriculum. Students could measure pollution of air and water, predict the life expectancy of existing solid waste disposal areas, conduct land-use surveys, study the history and design of zoning, health and conservation ordinances, evaluate present and predict future water-resource needs, and engage in many other real-life educational ventures.

The degree of direct involvement with a problem will be determined by the level of the school group in terms of academic achievement, grade, and reasonable proximity to the problem area. Field trips should include visits to industrial complexes, sewage treatment plants, polluted streams and lakes, farmlands where insecticides are either used or not used, as well as the traditional residence experiences at outdoor centers. Use should be made of the Environmental Study Areas newly established under the direction of the Secretary of the Interior, Walter Hickel, by the National Park Service. Urban districts should utilize the "vest pocket" parks and other surrounding small open space areas available in their communities.

3. An improved means of transmitting to schools information available in many state agencies, about environmental problems, should be developed. Many studies, reports, maps, plans and other data developed by various state agencies could become important, integral parts of the school curriculum if a method of continuous communication could be developed.

ADULT EDUCATION COURSES

Discussion

The adult education programs offered by many New Jersey communities provide an invaluable service to citizens who wish to continue and improve their education. Current courses cover a broad range of academic and leisure skill subjects, and community support for more diversified and expanded programs is increasingly evident. The existing organizational and administrative bases for adult education are certainly adequate to handle greater public demand. In the case of communities which have not or cannot sponsor adult programs, neighboring districts are willing to enroll non-resident adults.

It is particularly important that the adult sector which controls the life of the community be reached. Environmental quality is a social problem which adults must be given the opportunity to learn more about if they are to exert effective leadership. Although the mass media have the ability to bring problems to the attention of the public, they cannot be expected to provide fundamental knowledge of environmental principles and processes which citizens must apply in their problem solving efforts. There is, therefore, a need at the community level for an adult oriented survey course on the environment—a course which begins with general principles and which progresses, through the use of local examples, to a consideration of the specific environmental issue of nation, state, and community.

Recommendations

1. At a minimum, one survey course on the problems of the environment should be part of every adult education program. In the design and conduct of the course, use should be made of members of the community who, either by vocation or avocation, are involved in environmental affairs, for example: members of the municipal planning boards, and conservation commissions; representatives of local businesses and citizen action groups; resource specialists of federal and state government. Such personnel might be employed effectively as teachers or guest lecturers for the course.

2. If response to the survey course is favorable, it is recommended that additional courses of a more detailed and specific nature, such as community planning, pollution abatement, and general ecology, be designed and offered, either through the adult education program or through the extension and community service divisions of neighboring institutions of higher learning.

3. Adult Education administrators and staff should examine all course offerings in the adult education program and suggest that the use of environmental issues be incorporated as appropriate.

EDUCATION OF THE GENERAL PUBLIC

Discussion

Our society is dependent upon the mass media for much of its information, and the media represents one of the most effective and economical means of bringing environmental issues to the attention of the vast body politic. Continuous and reliable coverage of such issues is an important component of any overall plan to increase the public's awareness, knowledge, and willingness to act in the interest of environmental quality.

There are, of course, other productive methods of reaching the general public. Local sponsorship of public forums, educational displays, and similar special events are a proven way of fostering public interest and support. Another example is the film. "Later, perhaps", produced by the New Jersey State Council for Environmental Education. Highlighting the State's pressing environmental problems, the film reveals that at least some schools, through curriculum revision and the use of innovative teaching methods, are engaged in an effort to teach their students about man's dependence upon and responsibility for the environment. The film finally suggests that the audience examine the programs of their own schol systems for environmental content.

The means are immaterial, but the general public must be made knowledgeable if it is to understand and support the efforts of government and industry to restore environmental quality.

Recommendations

1. The Technical Advisory Committee on Environmental Education should consider the development of a comprehensive state-level public education program, to keep the public continually informed of the environmental problems of state and community, and to foster increased citizen participation in the solution of such problems. This dissemination effort could include such vehicles as forums, lectures, magazines, newspapers, films, radio and television programs. The New Jersey Public Broadcasting Authority, launched in January, 1970, might be particularly valuable in this respect.

2. The Commissioner of Education and the Technical Advisory Committee should encourage the development of local public education programs. There is an infinite number of ways a local public education program could be conducted and it is worthwhile to mention a few.

Local newspapers should be urged to cover environmental issues and possibly even carry a weekly or bi-weekly column devoted to the environment.

Educational displays should be constructed and placed in local business establishments and public buildings.

Evening forums on local issues should be organized and speakers recruited from the ranks of local and county government, business, county and local based governmental resource agencies, schools and colleges, civic and other groups.

Walking and driving tours of the local region should be developed to acquaint citizens with the environmental challenges and opportunities extant within their home communities. These tours, conducted on a bi-weekly or monthly basis, would identify specific environmental problems as well as follow through on their elimination.

3. Hopefully, these facets of a public education program would lead to corrective action on two fronts: to urge the general public to maintain awareness of environmental issues and the course of their alleviation; and to spur the contributors to local pollution and other forms of environmental deterioration, not the least of whom is the general public itself, to initiate and maintain measures eradicating the environmental problems lest further despoilation occurs.

LOCAL CONCERNED CITIZENS COMMITTEE

Discussion

As citizens become alerted to and concerned about the problems associated with the environmental crisis, they will demand greater participation in the decision-making process effecting solutions to these problems.

These citizens will also want to know what is being taught in the schols relative to environmental problems. They will naturally want young people to move into adulthood with a thorough understanding of the causes and consequences of the current problems, and their solutions. Inevitably, these citizens will want to insure that the school curriculum is relevant to the world that young people face, and will face.

Municipal Conservation Commissions, recommended by legislation enacted in 1968, are being formed throughout the state. Kindred groups, such as Survival, Inc., Friends of the Earth, and other environmentally related organizations, have directed attention toward environmental education programs in the schools.

Recommendation

The Commissioner of Education should urge each school district to create a Concerned Citizens Committee on Environmental Education. This committee would serve as liaison between environmentally related organizations, such as those mentioned above, as well as local established governmental agencies, and the local schools, This committee would also assist the school district in the study of local problems and in the development of pertinent curriculum materials. It would report regularly to the Superintendent of Schools, Board of Education, or a designated administrative staff member. Local businessmen, representatives of labor, government, industry, medicine, the clergy, conservation commission, school personnel, and others who are in a position to contribute services and advice for those planning programs in environmental education should be invited to serve on the Concerned Citizens Committee.

HIGHER EDUCATION

Discussion

College and university students have become increasingly concerned about the environment. The national teach-in (scheduled for April 22, 1970) will mark the beginning of a period of intense examination of environmental quality by the student body. There is little evidence, however, to show that our institutions of higher education are responding to the challenge of the environment in any planned manner, either the undergraduate or graduate level.

In 1968 the New Jersey State Council for Environmental Education appointed an ad hoc committee to review this situation in the colleges and universities of the state. Generally, it found that environmental understandings and issues are not being incorporated into general education and specialized curricula. When environmental quality was discussed, it was usually restricted to a few specialized and technical courses. An inter-disciplinary treatment of the subject was found to be a rarity. While the ad hoc committee recognized the need for highly specialized courses of study, it stated that there was a compelling need for a preprofessional and liberal arts program that would inform students of one of society's most pressing problems.

At Glassboro, Trenton and Montclair State Colleges, graduate programs have been established to prepare teachers as environmental education specialists. The initial programs were made possible by the Education Professions Development Act, which provided stipend support for experienced and prospective teachers and institutional assistance for each of the three colleges. This cooperative program has produced approximately forty graduates who have a master's degree in Conservation and Outdoor Education. Presently, seventy students are enrolled in similar, but not non-federally supported programs.

For nearly twelve years, teacher education students at the state colleges have spent five days in residence at the New Jersey State School of Conservation in

Branchville. Attendance at the school was made a graduation requirement in 1957 by action of the State Board of Education. When the Board of Higher Education assumed control of the state colleges, this requirement was made optional. Presently, only students from Glassboro and Trenton State Colleges participate in the program. In addition, during their junior year practicum experience, Glassboro students are given an opportunity to work with and observe youngsters at the Conservation and Environmental Science Center at Brown's Mills. Several State Colleges and Rutgers (the State University) have offered in-service conservation and environmental education courses and workshops at various locations throughout the state. These courses are designed to acquaint teachers with environmental problems and to assist in curriculum development.

Recommendations

1. The colleges, community colleges, junior colleges, and universities of the state should re-examine their existing statements of educational objectives to insure that the concept of harmony between man and environment is in some way expressed as an essential goal.

2. Each institution of higher learning should establish a faculty-student committee on environmental education. The purpose of the committee will be to explore and recommend desirable modifications of present course offerings and to develop new courses at the introductory and intermediate levels. The establishment of interdisciplinary courses on the environment should be especially encouraged.

The faculty-student committees should promote and facilitate independent study programs and similar course structures in which students would be able to work with local planning boards, health boards, conservation commissions, and similar entities. Such courses would not only be of tremendous assistance to local communities but would furnish students with invaluable experience and perspective.

3. Offerings at community and junior colleges should be expanded to include environmental education courses as a general or liberal education requirement, and also as terminal vocational training programs to prepare students as technicians to work in the emerging field of environmental quality.

RESOURCES AND FACILITIES FOR ENVIRONMENTAL EDUCATION

For the past twenty years, the State Department of Education, several State Colleges and some of the school districts have developed and initiated programs of instruction which use out-of-classroom learning techniques. A few programs became well established during the twenty year period, such as Ridgewood and Livingston Public School programs and the New Jersey State School of Conservation.

As school programs developed it became apparent that pre-service and in-service teacher education programs had to be designed to help teachers with subject content and methods of teaching in out-of-school situations. Several colleges responded by offering workshops and extension courses.

The State Colleges supported the program of pre-service and in-service education offered at the New Jersey State School of Conservation and this state operated facility has recently accommodated 4,500 college students, adults, teachers and 2,500 school pupils each year.

Through federal and state funding in Title III of the Elementary-Secondary Education Act of 1965 and its amendments, more than $1,000,000 has been allotted to develop additional centers for environmental education and teacher training.

Four centers, created through Title III are:

1. The Conservation and Environmental Science Center, a consortium of more than sixty school districts, located at Brown's Mills, has developed a capacity for originating and producing curriculum guides. This Center operates several college-sponsored teacher training courses which prepare teachers to use these guides and to produce original material for environmental education in urban, suburban, rural and marine environments. In addition, the Conservation and Environmental Science Center maintains a one-day field study program in all seasons and a limited resident program in environmental education each week of the school year.

2. The Union County consortium of school districts has developed a day-use program at the "Deserted Village" site in Union County.

3. The Stepping Stone Environmental Education Center in Branchville has developed resident facilities, a resident program, a day-use and school-site visitation programs.

4. At Sandy Hook, the Middletown Township Board of Education operates a shore and marine center for environmental education for Middletown Township schools and Brookdale College.

In addition to the above centers, two local school district-based programs have been developed. One, at Madison Township, is entitled "A Classroom for Today's World," and the other in Trenton, is entitled "Action Bound."

County parks and museums, such as those in Monmouth, Bergen, Somerset, and Morris Counties have also developed day programs in conservation and natural history studies.

Schools and colleges have received much aid from the lectures and demonstrations provided by state and federal agencies. Staff members from state agencies such as the Division of Geology and Topographic Survey, Division of Fish and Game, and the Division of Forests and Parks have volunteered their services for school talks and demonstrations. The U.S. Soil Conservation Service and Rutgers University Extension Service have also contributed staff time and expertise to school groups.

The Urban Schools Development Council, the Educational Improvement Center for Southern New Jersey, and the Somerset County Media Center, all initiated through Title III funding, have served and can continue to serve as clearing houses and dissemination units to assist educators and others. *These supplementary* education *centers have developed* a capability for creating curriculum materials and for making these materials available to the schools.

The efforts of all of these agencies have just made a beginning in helping schools to develop programs in environmental education at every level from Kindergarten through twelfth grade. A far more intense and far reaching effort is needed to make the K–12 environmental education programs a reality.

Especially needed are more materials for environmental education in a variety of urban situations. Nowhere is environmental quality more deteriorated than in urban areas, and nowhere is environmental education less developed.

All existing agencies and expertise must be strengthened, financed, and utilized to achieve the goal of environmental education for all citizens in New Jersey.

The facilities and programs briefly described above, form a network for programs and curriculum development, service to school youth and adults, teacher training capability, and an excellent means for dissemination. The graphic illustration on the back cover indicates this network of existing resources and facilities.

ENVIRONMENTAL QUALITY EDUCATION ACT (A PROPOSAL TO NEW JERSEY LEGISLATORS)

An Act providing for the promotion, establishment, and operation of local school district environmental education programs, the establishment and operation of a network of Regional Environmental Education Facilities and Centers for the purpose of providing environmental education programs for public and private school students and teachers, and for the establishment and operation of a network of Environmental Education Curriculum Research and Development Centers.

This Act shall be known as the "Environmental Quality Education Act."

Whereas, the concern for the environment of man has become a dominant social issue of our time, and

Whereas, New Jersey is the most highly urbanized and the most industrialized state in the nation, and

Whereas, New Jersey, as a microcosm of the entire country, shows abundant evidence of environmental breakdown, and

Whereas, New Jersey's environmental crisis is not limited to tangible pollution problems, and

Whereas, the Departments of Education and Conservation and Economic Development have specific interest in improving education as a force for evironmental quality, and

Whereas, the public and Legislature have expressed their concern by the passage of the Green Acres Bond Act of 1961, the Water Bond Act of 1969 and the establishment of a Division of Clean Air and Water, and

Whereas, it is a prime objective to create an environmentally literate citizenry who understand their interdependence with and responsibility for the total environment, and who possess the knowledge and concern to solve existing problems and to prevent future ones.

Now therefore, be it enacted by the Senate and General Assembly of the State of New Jersey:

Section 1. The Commissioner of Education is hereby authorized and directed to promote the establishment and operation of local public and private elementary and secondary school education programs, and to assist in the development of such programs.

Section 2. The Commissioner of Education in consultation with the Commissioner of Conservation and Economic Development is hereby authorized to designate and operate and develop Regional Environmental Education Centers and facilities for the purposes of assisting in the development of environmental education programs in each school district and providing environmental education instruction to public and private elementary and secondary students and teachers.

Section 3. Any public or private agency may apply to the Commissioner of Education for designation as a Regional Environmental Education Center.

Section 4. The Commissioner of Education with the approval of the State Board of Education shall make rules and regulations prescribing the courses of study, schedule of fees, and use of Regional Environmental Education Centers for public and private schools.

Section 5. Instruction at Regional Environmental Education Centers shall include, but not be limited to the study of man and his environments, and problems of environmental pollution, erosion and survival as they relate to the fields of ecology and other sciences, social sciences, language arts, mathematics, the arts and humanities.

Section 6. Any public or private school in the State may arrange its schedule in accordance with rules of the Commissioner of Education so that its elementary and secondary school pupils may utilize the services and facilities of an environmental education center.

Section 7. Any school other than a public or private school except such school as is operated for profit in whole or in part may, upon application made to the Commissioner at the time and in the manner specified in the rules and regulations made by him, cause its pupils to utilize the services and facilities of a Regional Environmental Education Center.

Section 8. Upon proper application submitted to the Commissioner of Education by the local school district, the Commissioner is authorized, subject to available appropriations, to enter into agreements with, and to make cost sharing grants of money to local school districts or Regional Environmental Education Centers for the purposes of assisting in the costs of services for local student participation and other education services provided by the Regional Environmental Education Centers.

Section 9. Upon proper application submitted to the Commissioner of Education by a local school district, the Commissioner is authorized, subject to available appropriations to enter into agreements with, and to make grants of money to such local school district for the purpose of paying half of the cost of constructing and equipping local environmental education facilities.

Section 10. The New Jersey State School of Conservation and The Stepping Stone Environmental Education Center at Branchville, the Conservation and Environmental Science Center at Browns Mills, and The Sandy Hook Environmental Education Center, by virtue of their long standing and demonstrated capability aided by nearly $2,000,000 in federal grants, are hereby designated as Environmental Education Curriculum Research and Development Centers for the purpose of providing to local, public and private school districts services such as, but not limited to, development and dissemination of curriculum materials, teacher training, demonstration pilot programs, guidance in facility development and use, and consultative services to Municipal Conservation Commissions and other environmental interest groups.

Section 11. The Environmental Education Curriculum Research and Development Centers will concentrate their research and curriculum development efforts on problems related to pollution, erosion, land use, ecology, survival and related natural, physical and social sciences.

Section 12. The Commissioner of Education with the approval of the State Board of Education shall make rules and regulations for the establishment and operation of the Environmental Education Curriculum Research and Development Centers.

Section 13. The Commissioner of Education with the approval of the State Board of Education is hereby authorized to designate additional Environmental Education Curriculum Research and Development Centers as the need arises.

Section 14. The Commissioner of Education with the approval of the State Board of Education is hereby authorized to employ such personnel as may be necessary to carry out the purposes of this Act.

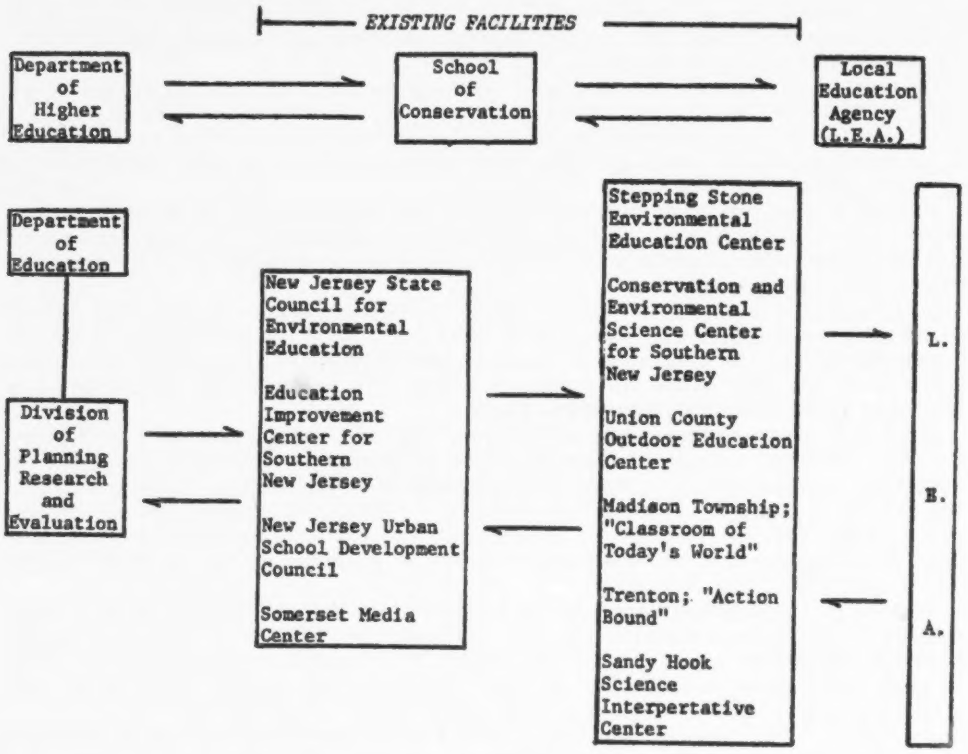
Section 15. There is hereby appropriated to the Department of Education the sum of $100,000 for the purpose of carrying out Sections 1 and 2 of this Act.

Section 16. There is hereby appropriated to the Department of Education the sum of $250,000 for the purpose of carrying out Sections 3, 4, 8, and 14 of this Act.

Section 17. There is hereby appropriated to the Department of Education the sum of $50,000 for the purpose of carrying out Section 9 of this Act.

Section 18. There is hereby appropriated to the Department of Education the sum of $100,000 for the purpose of carrying out Sections 10, 11, 12 and 13 of this Act.

Section 19. This Act shall take effect July 1, 1970.


EXISTING FACILITIES
Department of Higher Education
School of Conservation
Local Education Agency (L.E.A.)
Department of Education
Division of Planning Research and Evaluation
New Jersey State Council for Environmental Education
Education Improvement Center for Southern New Jersey
New Jersey Urban School Development Council
Somerset Media Center
Stepping Stone Environmental Education Center
Conservation and Environmental Science Center for Southern New Jersey
Union County Outdoor Education Center
Madison Township; "Classroom of Today's World"
Trenton; "Action Bound"
Sandy Hook Science Interpertative Center
L.
E.
A.

APPENDIX II.—MARBURGER LETTER TO ALLEN

STATE OF NEW JERSEY,
DEPARTMENT OF EDUCATION,
Trenton, N.J., March 25, 1970.

DR. JAMES E. ALLEN, JR.,
U.S. Commissioner of Education, Office of Education, Department of Health, Education, and Welfare, Washington, D.C.

DEAR JIM: I have read and given considerable thought to your recent speech and subsequent memorandum entitled "Special Message on Environmental/Ecological Education". In your memorandum you asked for my thoughts on the vital issue of "the state of our environment" and the critical need for an appropriate response by the education community. My response, in short, is a call for action in the form of some specific proposals.

First, I feel that New Jersey is uniquely suited by demonstrated leadership in environmental education to assist you in mobilizing an adequate educational response to the environmental crisis confronting our Nation.

I, therefore, am proposing "A National Center for Environmental Education". I further suggest that it be located in New Jersey, utilizing a demonstrated capability within our State and designed to serve the training and program needs of local education agencies across the Nation.

It is projected that such a center would be staffed to:

a. serve as a national clearing house;

b. review and edit curriculum materials being developed throughout the country and prepare this for inclusion into the ERIC system;

c. work with industry, labor, volunteer organizations, community action groups, government agencies in opening up communications among all of this independent groups;

d. produce teacher training films for national use;

e. develop other multi-media materials—films, TV tapes, cassettes, displays, teaching kits, and suggest new technology for improved teaching in the field of environmental education;

f. provide the U.S. Office of Education with a continuous assessment and planning unit regarding needs, trends and programs in this vital area;

g. establish a dissemination capability including work with mass-media in the production of TV presentations, news stories, and, in general, improve communications;

h. design and field test new programs utilizing a multi-disciplinary approach to environmental education;

i. develop curriculum models for general adult audiences, community planners, public officials and members of the business and industrial community;

j. refine present evaluation methods and instruments already available and develop new ones;

k. provide teacher training in environmental education utilizing established outdoor laboratories and field-tested K–12 programs.

Such a center would operate one or two training and curriculum development laboratories established on state lands uniquely suited for outdoor laboratory experiences necessary for effective teacher and other leadership training.

It may also be of interest to you to know that I have been assured by the Executive Director of the National Outdoor Education Association, now housed on the campus of Southern Illinois University, Carbondale, Illinois, that this organization would join forces with a national center for environmental education if it were located in New Jersey. Resources of this national association would be built into a network which would be developed by the center. This is the oldest association in the field of outdoor environmental education. It started as a part of LIFE magazine operations back in 1925, and has an extensive library and film collection as well as materials and other resources.

Secondly, I propose to begin to implement a master plan for environmental education in New Jersey which has been under development for the past three years.* Sections of the plan I expect to take action on soon include:

1. the establishment of a Technical Advisory Committee on Environmental Education. This committee will include representation of major departments of State government as well as citizens from a variety of occupations and associations. A professional staff will be employed. A sum of $90,000 is currently available to me for this purpose.

2. operation of two of the suggested Regional Training and Curriculum Development Centers for Environmental Ecological Education with the capability to:

a. develop training films and filmstrips;

b. expand and accelerate the development of curriculum materials for grades K–12;

c. provide pre-service and in-service training for teachers in environmental education.

The centers will operate on state-owned lands, however, funds are available to support the staff and activities of only one center.

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*Master Plan for Environmental Education—A proposal—See attachment No. 1.

3. I propose to establish a dissemination component to interpret information related to environmental quality and related programs to all appropriate audiences including special assistance to the newly established Municipal Conservation Commissions. To initiate this program, I plan to assume title to the extensive equipment made available by a Title III, Dissemination Project being phased out.

Additional federal, state and local funds will be needed to implement these components. Federal aid will be particularly important at this initial stage.

To implement the New Jersey Master Plan, a strategy will be worked out within the next few weeks. However, if a National Center is to be housed in this State, it would be mutually beneficial to adapt New Jersey models to the needs of other areas of the Nation.

My third proposal goes well beyond our areas of administrative authority, however, as you have stated, if a coordinated effort is to be mounted, education "must provide a major thrust."

It seems to me that the critical environmental ecological problems facing our nation require the abandonment of discrete isolated efforts by bureaus and departments for a better coordinated effort involving all public and private resources. An illustration of such a coordinated approach is the result of three years of planning a state facility designed to utilize the resources of industry, education and university research should, in my judgment, be reviewed for possible federal-state action.

Plans and architectural sketches for this facility are available depicting:

a. long-range proposals for optimum use of land and other resources;

b. efficient utilization of local, state and federal agencies charged with maintenance of environmental quality;

c. relevant curricula in environmental/ecological studies for all citizens, and;

d. models of architecture in ecological harmony with their landscapes with optimum means for disposal of solid, liquid and gaseous wastes.

Obviously, in order to translate most of these proposals into viable models, considerable fiscal and consultant assistance will be required from the federal level.

Finally, so that you will not consider these proposals presumptuous and possibly unrealistic, let me provide some data which may explain why we have been able to move forward on or complete action on action suggested by your staff and feel the capability exists in New Jersey to implement the aforementioned proposals.

New Jersey has:

a long history of involvement in outdoor/environmental/ecological education. The late Dr. Lloyd B. Sharp launched his outdoor education concepts and programs in this State in the 1920's. During the 1930's and 1940's, a number of school districts experimented with direct learning in outdoor laboratories. A recent survey indicated that more than one-third of the districts are offering outdoor/environmental education programs.

in 1949, the State Department of Education created The New Jersey State School of Conservation, and later required all teacher-education majors to spend one week at this environmental education center as part of their total undergraduate preparation.

developed four additional environmental education centers through Title III of ESEA 1965.

attracted to this State or developed within the State, twenty to thirty nationally-known environmental education leaders.

established a New Jersey State Council for Environmental Education with representatives from five branches of State government and related organizations and associations.

sponsored, in 1968, with USOE support, a national conference on environmental education.

developed an evaluation instrument which has been field-tested and is recognized nationally.

passed legislation which provides for multi-district operation of environmental education programs.

recently redirected the major objectives of Rutgers—The State University—College of Agriculture from those normally expected of such a school to a newly designated College of Environmental Sciences.

initiated, at these colleges, Master of Arts degree programs in environmental education.

encouraged the establishment, at one community college, of a service center for environmental education.

inventoried school programs, available land, environmental laboratories, private and organizational facilities.

gained national recognition by having one of its Title III projects invited as one of six, out of a field of approximately 3,000 projects to appear before the President's Advisory Council Conference on Innovations—(March 30, 31, and April 1 in Washington, D.C.).

developed a *Master Plan for Environmental Education* for this State. (copy enclosed) It is in the process of identifying fiscal base for carrying out the recommendations incorporated in the Plan.

produced curriculum materials which could be disseminated across the Nation.

produced a film entitled, "Later . . . perhaps", which should be distributed to all schools, everywhere. (This can be made available for your review.)

above all, New Jersey has developed into the most populous, most industrialized, most polluted State in the Nation. We have more and more of worse and worse. We are a microcosm of America. What happens in New Jersey will most certainly happen to all the other states, only it will be "Later . . . perhaps."

One of the common criticisms of Title III and other programs is the failure to make new ideas and discoveries available to the entire educational community. One of the major tasks for the National Center will be dissemination through computer, films, teaching and curriculum materials and model programs.

I am sure that you agree, Jim, that ample precedence exists for establishing such centers, i.e., centers in early childhood, as well as a national network of other research and development units that were created to meet other critical needs in education.

Because of the urgency of the situation, I hope you will be able to schedule a meeting with a small delegation from New Jersey to discuss the concerns you expressed in your memorandum and speech and the proposals outlined above. If this could be arranged while several of my staff are in Washington on March 30, 31 and April 1, I could arrange my time to be with you.

I shall look forward to your response.

Sincerely,

CARL L. MARBURGER,
Commissioner of Education.

APPENDIX III.—ASSEMBLY, NO. 1092—STATE OF NEW JERSEY, INTRODUCED MAY 14, 1970, BY ASSEMBLYWOMAN MARGETTS, ASSEMBLYMEN EWING, KEAN, PFALTZ, McDONOUGH, KIEHN, FAY AND FLORIO, REFERRED TO COMMITTEE ON EDUCATION

AN ACT providing for the promotion, establishment, and operation of local school district environmental education programs, the establishment and operation of a network of Regional Environmental Education Facilities and Centers for the purpose of providing environmental education programs for public and private school students and teachers, for the establishment and operation of a network of Environmental Education Curriculum Research and Development Centers, and making an appropriation.

Be it enacted by the Senate and General Assembly of the State of New Jersey:

1. This act shall be known as the "Environmental Quality Education Act."

2. The Legislature finds and declares:

a. The concern for the environment of man has become a dominant social issue of our time;

b. Since New Jersey is the most highly urbanized and the most industrialized State in the Nation, it serves as a microcosm of the entire country, and shows abundant evidence of enviromental breakdown;

c. New Jersey's environmental crisis is not limited to tangible pollution problems;

d. The State Departments of Education and Environmental Protection have specific interest in improving education as a force for environmental quality;

e. The public and Legislature have expressed their concern by the passage of the Green Acres Bond Act of 1961, the Water Bond Act of 1969 and the establishment of a Department of Environmental Protection; and

f. It is a prime objective to create an environmentally literate citizenry who understand their interdependence with and responsibility for the total environment, and who possess the knowledge and concern to solve existing problems and to prevent future ones.

3. The Commissioner of Education is hereby authorized and directed to promote the establishment and operation of local public and private elementary and secondary school environmental education programs, and to assist in the development of such programs.

4. The Commissioner of Education in consultation with the Commissioner of Environmental Protection is hereby authorized to designate and operate and develop Regional Environmental Education Centers and facilities for the purpose of assisting in the development of environmental education programs in each school district and providing environmental education instruction to public and private elementary and secondary students and teachers.

5. Any public or private agency may apply to the Commissioner of Education for designation as a Regional Environmental Education Center.

6. The Commissioner of Education with the approval of the State Board of Education shall by rules and regulations prescribe the courses of study, schedule of fees, and use of Regional Environmental Education Centers for public and private schools.

7. Instruction at Regional Environmental Education Centers shall include, but not be limited to the study of man and his environments, and problems of environmental pollution, erosion and survival as they relate to the fields of ecology and other sciences, social sciences, language arts, mathematics, the arts and humanities.

8. Any public or private school in the State may arrange its schedule in accordance with rules of the Commissioner of Education so that its elementary and secondary school pupils may utilize the services and facilities of an environmental education center; and any school, except such school as is operated for profit in whole or in part, may, upon application made to the commissioner at the time and in the manner specified in the rules and regulations made by him, cause its pupils to utilize the services and facilities of a Regional Environmental Education Center.

9. Upon proper application submitted to the Commissioner of Education by the local school district, the commissioner is authorized, subject to available appropriations, to enter into agreements with, and to make cost sharing grants of money to local school districts or Regional Environmental Education Centers for the purposes of assisting in the costs of services for local student participation and other education services provided by the Regional Environmental Education Centers.

10. Upon proper application submitted to the Commissioner of Education by a local school district, the commissioner is authorized, subject to available appropriations to enter into agreements with, and to make grants of money to such local school district for the purpose of paying half of the cost of constructing and equipping local environmental education facilities.

11. The New Jersey State School of Conservation and the Stepping Stone Environmental Education Center at Branchville, the Conservation and Environmental Science Center at Browns Mills, and the Sandy Hook Environmental Center, by virtue of their long standing and demonstrated capability aided by nearly $2,000,000.00 in Federal grants, are hereby designated as Environmental Education Curriculum Research and Development Centers for the purpose of providing to local, public and private school districts services such as, but not, limited to, development and dissemination of curriculum materials, teacher training, demonstration pilot programs, guidance in facility development and use, and consultative services to municipal conservation commissions and other environmental interest groups. The Environmental Education Curriculum Research and Development Centers shall concentrate their research and curriculum development efforts on problems related to pollution, erosion, land use, ecology, survival and related natural, physical and social sciences.

12. The Commissioner of Education with the approval of the State Board of Education shall:

a. Make rules and regulations for the establishment and operation of the Environmental Education Curriculum Research and Development Centers;

b. Designate additional Environmental Education Curriculum Research and Development Centers as the need arises; and

c. Employ such personnel as may be necessary to carry out the purposes of the act.

13. There is hereby appropriated to the Department of Education the sum of $500,000.00 for the purpose of carrying out the purposes of this act.

14. This act shall take effect immediately.

APPENDIX IV.—PROJECT

"RESTORE"

Regional Ecological Skills Training for Occupations Related to the Environment

Twelve Community Colleges, representing 160,000 students in the ten regions, have committed themselves to provide leadership necessary to meet the national vocational and ecological problems.

These Community Colleges have established an association for cooperative development and plan to obligate over six million dollars out of their operational budgets, over the next three years, to help solve environmental problems.

These colleges are prepared to assist in the development and implementation of state plans for environmental and ecological education (EEE). It is the "regional concept" that lines of communications be maintained and further developed between cooperative agencies and participating Community Colleges.

ABSTRACT

The purpose of the proposed E.E.E. program at Brookdale Community College is to provide readily assimilable instruction in five broad areas of occupational endeavor that will draw into the mainstream of American economic life persons in Region II now characterized as underemployed, unemployed, or disadvantaged. With emphasis upon public health and marine services, and using methodology and media particularly applicable to the type of training involved, programs will be provided for Inhalation Therapists, Nurses Aides, Emergency Room Aides, Marine Engine Repair and Maintenance, and Boat (small) Repair and Maintenance.

Direct objectives of these programs are to insure employability of persons in the above specified socioeconomic categories. These areas of employment here specifically set out as the nuclei upon which to build on ongoing program of instruction. It should, however, be pointed out that from these areas, tangential and/or ancillary occupations can easily be developed. Brookdale Community College is convinced that individuals have the right not to be molded into predetermined occupational shapes if their native aptitudes and interests dictate greater personal satisfaction and happiness in a selected, related field of endeavor. The specified programs will be kept flexible, therefore, so that individual needs and desires can reasonably be met.

Using the immediate training locale as an example of regional requirements and opportunities for employment, several salient circumstances exist. There is a vast reservoir of "underemployed, unemployed, or disadvantaged" persons in Monmouth County—fully 20 percent of the total population. Recruitment for the program therefore poses no problem. That these people need only the encouragement to seek salable skills and the promise of job opportunities to become actively participating members of society is amply borne out by the observations of the designated administrator of the proposed programs.

The programs themselves provide the encouragement; the promise becomes self-evident in the job opportunities available but now unfilled. For example, within the county, two existing medical facilities—Riverview Hospital in Red Bank and the Monmouth Medical Center in Long Branch—are currently in need of employees in the nursing and allied medical categories. The Atlantic Ocean Shoreline for New Jersey is approximately 130 miles long, of which about 30 miles borders Monmouth County. Hundreds of additional miles of estuarine, bay, and river shores offer supplemental marine and aquatic navigational zones. These waterways support numerous boat and boat associated industries for both recreational and commercial interests. Therefore, the current shortages of trained mechanics and repairmen that should service this interest provides a necessary market for skilled graduates.

How all of these ancillary jobs relate directly to E.E.E. is explained in detail in the body of the proposal itself. Here suffice it to say that the relationship is both real and urgent. In addition, the need on both sides—society's and the potential students'—is equally real and urgent. The proposed programs would be carried out in locations owned and/or rented or in areas where use has been granted to Brookdale Community College, including field sites. The project is planned to begin on or about July 1, 1970 and to end on or about June 30, 1971.

DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
OFFICE OF EDUCATION
WASHINGTON, D.C. 20202

COST OF OCCUPATIONAL TRAINING
MANPOWER DEVELOPMENT AND TRAINING ACT
PART B

(X one) ☐ Section 231 ☐ Section 241 ☐ Section 251 ☐ Nat'l Contract ☐ Coupled OJT ☒ Other (Specify)

BUDGET BUREAU NO. 51-R0400
APPROVAL EXPIRES: 6/30/70

PROJECT NUMBER: NJ

STATE: New Jersey

DATE: [illegible]

SIGNATURE AND TITLE OF LOCAL OFFICIAL RESPONSIBLE FOR FUNDS ITEMIZED BELOW

1. NAME AND ADDRESS OF LOCAL PUBLIC TRAINING AGENCY RESPONSIBLE FOR THIS COURSE
Brookdale Community College, 765 Newman Springs,Road, Lincroft, New Jersey 07738

NAME AND ADDRESS OF INSTITUTION OR AGENCY (School) THAT WILL CARRY OUT THIS TRAINING COURSE

(X one) ☒ Public ☐ Non-Public

2. OCCUPATIONAL TITLE: Umbrella - Project "Restore"

DOT CODE NUMBER:

(X one) ☐ Budget estimate ☒ Budget revision ☐ Tentative final cost ☐ Actual cost

(X one) ☒ Initial ☐ Repeat project ☐ Other (Explain)

PREVIOUS PROJECT NO.

		AMOUNT REQUESTED OR EXPENDED	FOR STATE AND FEDERAL USE ONLY AMOUNT APPROVED
3. FACILITY COSTS	TOTAL	$ 59,200.00	$
1. FACILITY CHARGES (Include rent)		40,000.00	
2. UTILITIES (Include telephone)		13,200.00	
3. MINOR REMODELING		6,000.00	
4. ADMINISTRATIVE SALARIES	TOTAL	$ 91,244.00	$
1. ADMINISTRATION		21,180.00	
2. CLERICAL AND ACCOUNTING		6,500.00	
3. CUSTODIAL		26,000.00	
4. OTHER ADMINISTRATIVE COSTS		11,800.00	
5. EMPLOYER SHARE OF EMPLOYEE BENEFITS		25,764.00	
5. INSTRUCTIONAL AND EDUCATIONAL COUNSELING SALARIES	TOTAL	$ 202,200.00	$
1. SUPERVISORS SALARIES		18,000.00	
2. GUIDANCE COUNSELORS SALARIES		25,000.00	
3. INSTRUCTORS SALARIES		68,500.00	
4. OTHER INSTRUCTIONAL PERSONNEL		89,700.00	
5. TRAVEL		1,000.00	
6. EQUIPMENT	TOTAL	$ 112,300.00	$
1. MAJOR INSTRUCTIONAL EQUIPMENT		66,000.00	
2. REPAIR AND SERVICING		2,400.00	
3. MINOR EQUIPMENT AND TOOLS		42,000.00	
4. RENTAL OF INSTRUCTIONAL EQUIPMENT		1,900.00	
5. OTHER CAPITAL EXPENDITURES		--------------	
6. OTHER MAINTENANCE AND REPAIR		--------------	
7. INSTRUCTIONAL MATERIALS AND SUPPLIES	TOTAL	$ 57,600.00	$
1. AUDIO VISUAL AIDS		15,300.00	
2. TEXTBOOKS AND REFERENCE BOOKS		3,300.00	
3. WORKBOOKS AND PAPERBACKS		7,000.00	
4. SUPPLIES AND MATERIALS		32,000.00	
8. OTHER COSTS NOT ELSEWHERE CLASSIFIED	TOTAL	$ 11,560.00	$
1. TUITION		--------------	
2. TRAINEE TRANSPORTATION		3,600.00	
3. OTHER MISCELLANEOUS COSTS		7,960.00	
9. OTHER THAN PROJECT		$ ------------	$
10. TOTAL COST	TOTAL	$ 534,104.00	$
11. AMOUNT OF FEDERAL FUNDS INCLUDED IN LINE 10		$ 484,924.00	$
12. AMOUNT OF MATCHING FUNDS INCLUDED IN LINE 10		$ 49,180.00	$
COST PER TRAINEE HOUR $			
TOTAL TRAINEES COMPLETING TRAINING (Number)			

STATE DIRECTOR, VOCATIONAL EDUCATION	DATE	COMMISSIONER'S REPRESENTATIVE	DATE

OE FORM 3117-1, 7/69

[illegible] AND WELFARE
OFFICE OF EDUCATION
[illegible]
[illegible] VOCATIONAL TRAINING
[illegible] DEVELOPMENT AND TRAINING ACT
PART B

☐ Section 231 ☐ Section 241
☐ Section 251 ☐ Skill Centers
☐ Coupled OJT ☒ Other (specify)

BUDGET [illegible]
APPROVAL [illegible]

PROJECT NUMBER NJ

STATE New Jersey

DATE MAY [illegible] 1970

[illegible] LOCAL OFFICIAL RESPONSIBLE FOR FUNDS ITEMIZED BELOW
Brookdale Community College, 765 Newman Springs Road, Lincroft, N.J.

[illegible] OF LOCAL PUBLIC TRAINING AGENCY RESPONSIBLE FOR THIS COURSE
Brookdale Community College, 765 Newman Springs Road, Lincroft, New Jersey 07738

[illegible] ADDRESS OF INSTITUTION OR AGENCY (Name) THAT WILL CARRY OUT THIS TRAINING COURSE

☒ [illegible]

OCCUPATIONAL TITLE: Administration and Counseling

DOT CODE NUMBER

☒ Budget estimate ☐ Budget revision
☐ Tentative final cost ☐ Actual cost

(X one) ☒ Initial ☐ Repeat project ☐ Other (Explain)

PREVIOUS PROJECT NO.

		AMOUNT REQUESTED OR EXPENDED	FOR STATE AND FEDERAL USE ONLY AMOUNT APPROVED
3. FACILITY COSTS	TOTAL	$ 2,200.00	$
1. FACILITY CHARGES (Include rent) @ $ 6.00 per square foot		1,000.00	
2. UTILITIES (Include telephone)		1,200.00	
3. MINOR REMODELING		--------	
4. ADMINISTRATIVE SALARIES	TOTAL	$ 41,080.00	$
1. ADMINISTRATION @ 25.00% of program cost		21,180.00	
2. CLERICAL AND ACCOUNTING		6,500.00	
3. CUSTODIAL		1,000.00	
4. OTHER ADMINISTRATIVE COSTS		7,000.00	
5. EMPLOYER SHARE OF EMPLOYEE BENEFITS		5,400.00	
5. INSTRUCTIONAL AND EDUCATIONAL COUNSELING SALARIES	TOTAL	$ 50,000.00	
1. SUPERVISORS SALARIES		18,000.00	
2. GUIDANCE COUNSELORS SALARIES		25,000.00	
3. INSTRUCTORS SALARIES		--------	
4. OTHER INSTRUCTIONAL PERSONNEL		5,000.00	
5. TRAVEL		2,000.00	
6. EQUIPMENT	TOTAL	$ 0.00	$
1. MAJOR INSTRUCTIONAL EQUIPMENT		---------	
2. REPAIR AND SERVICING		---------	
3. MINOR EQUIPMENT AND TOOLS		---------	
4. RENTAL OF INSTRUCTIONAL EQUIPMENT		---------	
5. OTHER CAPITAL EXPENDITURES		---------	
6. OTHER MAINTENANCE AND REPAIR		---------	
7. INSTRUCTIONAL MATERIALS AND SUPPLIES	TOTAL	$ 9,000.00	$
1. AUDIO VISUAL AIDS		3,000.00	
2. TEXTBOOKS AND REFERENCE BOOKS		1,000.00	
3. WORKBOOKS AND PAPERBACKS		3,000.00	
4. SUPPLIES AND MATERIALS		2,000.00	
8. OTHER COSTS NOT ELSEWHERE CLASSIFIED	TOTAL	$ 3,660.00	$
1. TUITION		--------	
2. TRAINEE TRANSPORTATION		800.00	
3. OTHER MISCELLANEOUS COSTS		2,560.00	
9. OTHER THAN PROJECT		$ --------	$
10. TOTAL COST	TOTAL	$ 105,940.00	$
11. AMOUNT OF FEDERAL FUNDS INCLUDED IN LINE 10		$ 83,760.00	$
12. AMOUNT OF MATCHING FUNDS INCLUDED IN LINE 10.		$ 22,180.00	$
COST PER TRAINEE HOUR $			
TOTAL TRAINEES COMPLETING TRAINING (Number)			

STATE DIRECTOR, VOCATIONAL EDUCATION	DATE	COMMISSIONER'S REPRESENTATIVE	DATE

ABSTRACT

The Administration and Counseling services necessary to properly support this occupational training task are functions that shall be in addition to those normally provided by Brookdale Community College. This is partly caused by the dispersal locations of training sites, i.e., Inhalation Therapist and Hospital Aides to have their clinical experiences at one of three general hospitals in Monmouth County, New Jersey, while the marine skills will be done at an aquatic site which of necessity will be off campus. Conversely, both of these training fields will have their common general educational, remedial educational and guidance and counseling functions presented in the environs of the college community. Brookdale Community College already has in its Community Services Department the capability of program direction and will assume this project operation.

1. *General Information*

1.1 Brookdale Community College.

1.2 Brookdale Community College, 765 Newman Springs Road, Lincroft, New Jersey 07738, (201) 842-1900.

1.3 Administration and Counseling.

1.4 104.

1.5 52 weeks at 40 hours per week.

1.6 1 September 1970–1 September 1971.

1.7 If articles or materials are developed during this project, the disposition of all requested materials and services will be consistent with MDTA regulations.

1.8 I, Ervin L. Harlacher, President of Brookdale Community College, certify that employment of personnel and the purchase of goods and services will be conducted in accordance with all local State and Federal laws, requirements, regulations, and policies.

E. L. Harlacher.

May 26, 1970.

1.9 I, Ervin L. Harlacher, President of Brookdale Community College, certify that Brookdale Community College will prepare a brief written evaluation of the instructional program which will include an assessment of: local administration, instruction; supervision; trainee achievement and placement; and, recommendations for improving the instructional program. These evaluations will be submitted to the State agency by Brookdale Community College within approximately 30 days after the conclusion of the activities included in this plan or at such other time as required. Additional copies will be provided to other educational agencies, local State and other agencies upon request.

E. L. Harlacher.

May 26, 1970.

1.10 I, Ervin L. Harlacher, President of Brookdale Community College, certify that employees of Brookdale Community College who are reimbursed for services provided to MDTA activities will provide such services beyond their normal work day in accordance with DTA regulations.

E. L. Harlacher.

May 26, 1970.

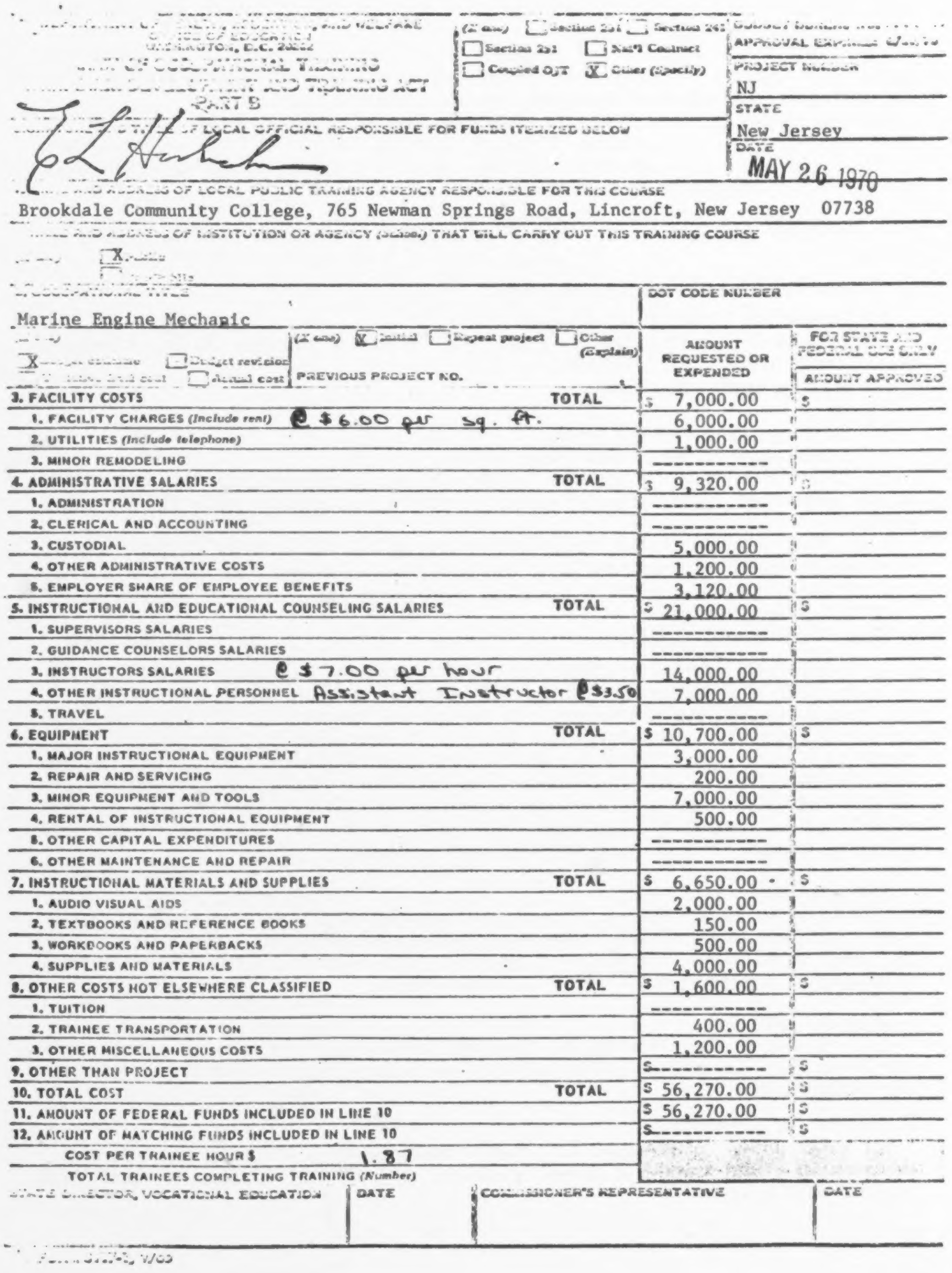
1.11 "I certify that this application will not be used to reduce expenditures for Vocational Education by the responsible training agency if MDTA activities are authorized."

2. *Course information*

2.1 *Objectives.*—To administer and give guidance and counseling services to the unemployed, underemployed and disadvantaged trainees that shall take part in this employability skills function while at Brookdale Community College.

2.2 *Topical Outline of Major Units.*—Not applicable.

2.3 *Evaluation of Trainee Progress.*—Evaluation of this trainee will be done as humanly objective as this type trainee will afford for he or she has usually suffered defeat in prior educational exposures. Skill proficiency, work readiness, and employability shall be the critical evaluative roadmarkers for these trainees. Evaluation techniques will be developed so that they are adaptable to this training program as to be done at Brookdale Community College.



DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
OFFICE OF EDUCATION
WASHINGTON, D.C. 20202
COST OF OCCUPATIONAL TRAINING
MANPOWER DEVELOPMENT AND TRAINING ACT
PART B

(X one) ☐ Section 231 ☐ Section 241
☐ Section 251 ☐ Nat'l Contract
☐ Coupled OJT ☒ Other (Specify)

BUDGET BUREAU NO. [illegible]
APPROVAL EXPIRES [illegible]
PROJECT NUMBER NJ
STATE New Jersey
DATE MAY 26 1970

SIGNATURE AND TITLE OF LOCAL OFFICIAL RESPONSIBLE FOR FUNDS ITEMIZED BELOW

1. NAME AND ADDRESS OF LOCAL PUBLIC TRAINING AGENCY RESPONSIBLE FOR THIS COURSE
Brookdale Community College, 765 Newman Springs Road, Lincroft, New Jersey 07738

NAME AND ADDRESS OF INSTITUTION OR AGENCY (School) THAT WILL CARRY OUT THIS TRAINING COURSE
(X one) ☒ Public ☐ Private

2. OCCUPATIONAL TITLE Marine Engine Mechanic
DOT CODE NUMBER

(X one) ☒ Budget estimate ☐ Budget revision ☐ [illegible] final cost ☐ Actual cost
(X one) ☒ Initial ☐ Repeat project ☐ Other (Explain)
PREVIOUS PROJECT NO.

		AMOUNT REQUESTED OR EXPENDED	FOR STATE AND FEDERAL USE ONLY AMOUNT APPROVED
3. FACILITY COSTS	**TOTAL**	$ 7,000.00	$
1. FACILITY CHARGES (Include rent) @ $6.00 per sq. ft.		6,000.00	
2. UTILITIES (Include telephone)		1,000.00	
3. MINOR REMODELING		----------	
4. ADMINISTRATIVE SALARIES	**TOTAL**	$ 9,320.00	$
1. ADMINISTRATION		----------	
2. CLERICAL AND ACCOUNTING		----------	
3. CUSTODIAL		5,000.00	
4. OTHER ADMINISTRATIVE COSTS		1,200.00	
5. EMPLOYER SHARE OF EMPLOYEE BENEFITS		3,120.00	
5. INSTRUCTIONAL AND EDUCATIONAL COUNSELING SALARIES	**TOTAL**	$ 21,000.00	$
1. SUPERVISORS SALARIES		----------	
2. GUIDANCE COUNSELORS SALARIES		----------	
3. INSTRUCTORS SALARIES @ $7.00 per hour		14,000.00	
4. OTHER INSTRUCTIONAL PERSONNEL Assistant Instructor @ $3.50		7,000.00	
5. TRAVEL		----------	
6. EQUIPMENT	**TOTAL**	$ 10,700.00	$
1. MAJOR INSTRUCTIONAL EQUIPMENT		3,000.00	
2. REPAIR AND SERVICING		200.00	
3. MINOR EQUIPMENT AND TOOLS		7,000.00	
4. RENTAL OF INSTRUCTIONAL EQUIPMENT		500.00	
5. OTHER CAPITAL EXPENDITURES		----------	
6. OTHER MAINTENANCE AND REPAIR		----------	
7. INSTRUCTIONAL MATERIALS AND SUPPLIES	**TOTAL**	$ 6,650.00	$
1. AUDIO VISUAL AIDS		2,000.00	
2. TEXTBOOKS AND REFERENCE BOOKS		150.00	
3. WORKBOOKS AND PAPERBACKS		500.00	
4. SUPPLIES AND MATERIALS		4,000.00	
8. OTHER COSTS NOT ELSEWHERE CLASSIFIED	**TOTAL**	$ 1,600.00	$
1. TUITION		----------	
2. TRAINEE TRANSPORTATION		400.00	
3. OTHER MISCELLANEOUS COSTS		1,200.00	
9. OTHER THAN PROJECT		$----------	$
10. TOTAL COST	**TOTAL**	$ 56,270.00	$
11. AMOUNT OF FEDERAL FUNDS INCLUDED IN LINE 10		$ 56,270.00	$
12. AMOUNT OF MATCHING FUNDS INCLUDED IN LINE 10		$----------	$
COST PER TRAINEE HOUR $ 1.87			
TOTAL TRAINEES COMPLETING TRAINING (Number)			

STATE DIRECTOR, VOCATIONAL EDUCATION	DATE	COMMISSIONER'S REPRESENTATIVE	DATE

FORM [illegible]

ABSTRACT

The purpose of the Marine Engine Mechanic program is to provide trainees with skills in the operation, maintenance, and repair of diesel, gasoline, and electric engines on small and medium size boats.

The project will educate the unemployed, underemployed, and the disadvantaged. The trainee will also take General Education courses with emphasis on the environmental effect of improper operating marine engines.

Monmouth County has approximately 30 miles of ocean and two major rivers that run through the county. Pleasure boating is one of the major sports in the area, and the population of the county increases from approximately 400,000 to two million in the summer.

Most pleasure boats are dry-docked in the county during the winter, and this provides employment for the maintenance of engines and the repair of boats.

1. *General Information and Agreements*

1.1 Brookdale Community College.

1.2 Brookdale Community College, 765 Newman Springs Road, Lincroft, New Jersey 07738, (201) 842-1900.

1.3 Marine Engine Mechanic.

1.4 20.

1.5 52 weeks, 30 hours per week.

1.6 1 September 1970—1 September 1971.

1.7 If articles or materials are developed during this project, the disposition of all requested materials and services will be consistent with MDTA regulations.

1.8 I, Ervin L. Harlacher, President of Brookdale Community College, certify that employment of personnel and the purchase of goods and services will be conducted in accordance with all local State and Federal laws, requirements, regulations and policies.

May 26, 1970.

E. L. HARLACHER.

1.9 I, Ervin L. Harlacher, President of Brookdale Community College, certify that Brookdale Community College will prepare a brief written evaluation of the instructional program which will include as assessment of: local administration; instruction; supervision; trainee achievement and placement; and, recommendations for improving the instructional program. These evaluations will be submitted to the State agency by Brookdale Community College within 30 days after the conclusion of the activities included in this plan or at such other time as required. Additional copies will be provided to other educational agencies, local State and other agencies upon request.

May 26, 1970.

E. L. HARLACHER.

1.10 I, Ervin L. Harlacher, President of Brookdale Community College certify that employees of Brookdale Community College who are reimbursed for services provided to MDTA activities will provide such services beyond their normal work day in accordance with MDTA regulations.

May 26, 1970.

E. L. HARLACHER.

1.11 "I certify that this application will not be used to reduce expenditures for Vocational Education by the responsible training agency if MDTA activities are authorized."

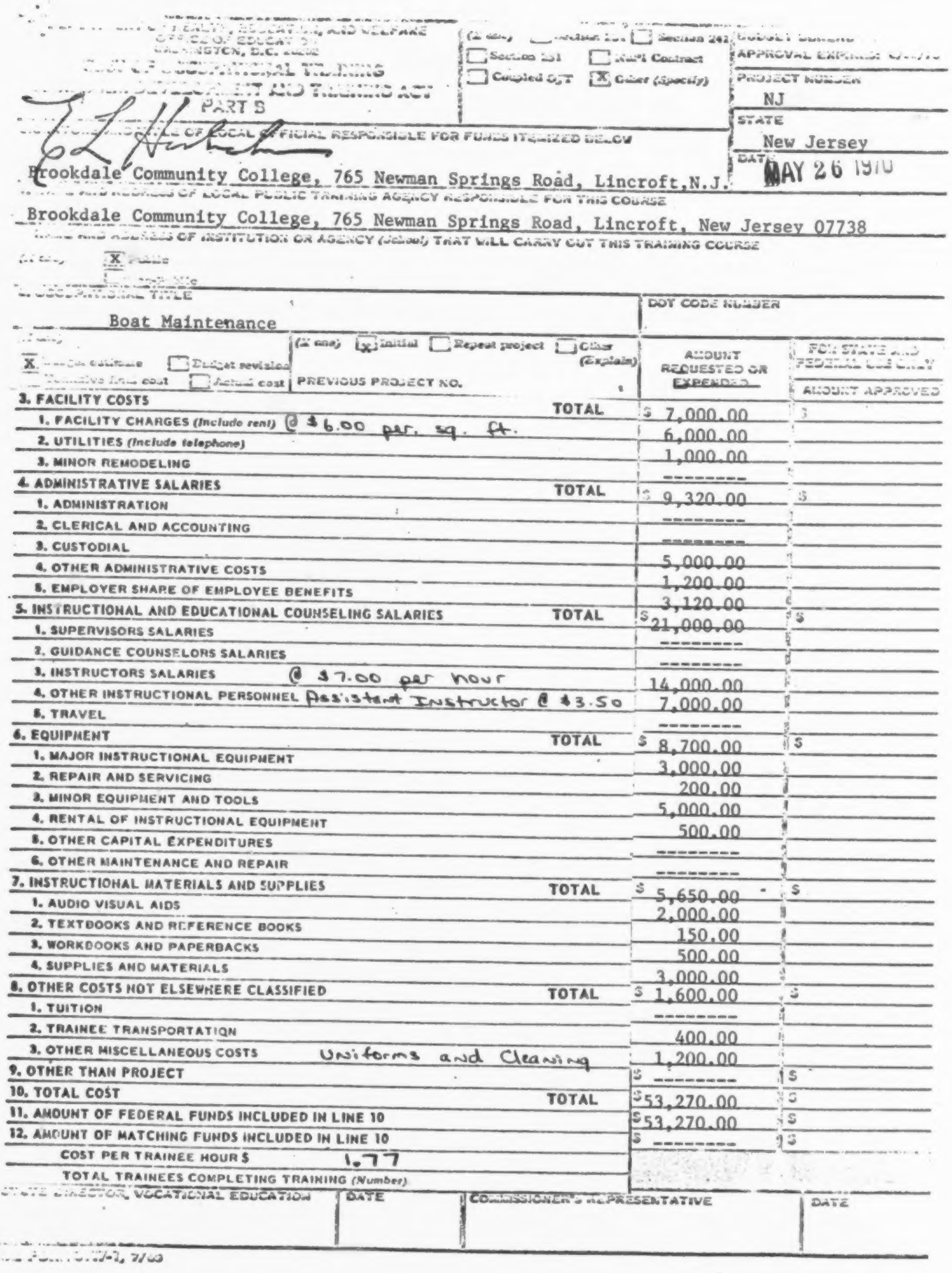
2. *Course Information*

2.1 The project is designed to provide trainees with skills in the operation, maintenance, and repair of diesel, gasoline, and electric engines on small and medium size boats.

2.2 Marine Engine Mechanic

	Clock hours
Basic engine principles	50
Automotive fuels and lubricants	25
Engine inspection and repair	225
Carburetor and fuel system repair	25
Drive train and component repair	50
Diesel engine principles	50
Diesel engine repair	300
Electrical system repair	50
Total	775

2.3 Evaluation of the trainees progress will be based upon his ability to master the activities listed above. The objective and subjective evaluations of the program will be developed by the instructor and trainees. The evaluation will be developed so that it is adaptable to programs operated on a regional basis and provide a measurement of the individual trainees progress.



DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
OFFICE OF EDUCATION
WASHINGTON, D.C. 20202
COST OF OCCUPATIONAL TRAINING
MANPOWER DEVELOPMENT AND TRAINING ACT
PART B

(X one) ☐ Section 2[illegible] ☐ Section 241 ☐ Section 231 ☐ [illegible] Contract ☐ Coupled OJT ☒ Other (Specify)

BUDGET BUREAU [illegible]
APPROVAL EXPIRES [illegible]

PROJECT NUMBER: NJ

STATE: New Jersey

DATE: MAY 26 1970

NAME AND TITLE OF LOCAL OFFICIAL RESPONSIBLE FOR FUNDS ITEMIZED BELOW

Brookdale Community College, 765 Newman Springs Road, Lincroft,N.J.
NAME AND ADDRESS OF LOCAL PUBLIC TRAINING AGENCY RESPONSIBLE FOR THIS COURSE

Brookdale Community College, 765 Newman Springs Road, Lincroft, New Jersey 07738
NAME AND ADDRESS OF INSTITUTION OR AGENCY (School) THAT WILL CARRY OUT THIS TRAINING COURSE

(X one) ☒ Public ☐ Non-Public

OCCUPATIONAL TITLE: Boat Maintenance

DOT CODE NUMBER:

(X one) ☒ Budget estimate ☐ Budget revision ☐ Tentative final cost ☐ Actual cost

(X one) ☒ Initial ☐ Repeat project ☐ Other (Explain)

PREVIOUS PROJECT NO.

		AMOUNT REQUESTED OR EXPENDED	FOR STATE AND FEDERAL USE ONLY AMOUNT APPROVED
3. FACILITY COSTS	TOTAL	$ 7,000.00	$
1. FACILITY CHARGES (Include rent) @ $6.00 par. sq. ft.		6,000.00	
2. UTILITIES (Include telephone)		1,000.00	
3. MINOR REMODELING		--------	
4. ADMINISTRATIVE SALARIES	TOTAL	$ 9,320.00	$
1. ADMINISTRATION		--------	
2. CLERICAL AND ACCOUNTING		--------	
3. CUSTODIAL		5,000.00	
4. OTHER ADMINISTRATIVE COSTS		1,200.00	
5. EMPLOYER SHARE OF EMPLOYEE BENEFITS		3,120.00	
5. INSTRUCTIONAL AND EDUCATIONAL COUNSELING SALARIES	TOTAL	$ 21,000.00	$
1. SUPERVISORS SALARIES		--------	
2. GUIDANCE COUNSELORS SALARIES		--------	
3. INSTRUCTORS SALARIES @ $7.00 per hour		14,000.00	
4. OTHER INSTRUCTIONAL PERSONNEL Assistant Instructor @ $3.50		7,000.00	
5. TRAVEL		--------	
6. EQUIPMENT	TOTAL	$ 8,700.00	$
1. MAJOR INSTRUCTIONAL EQUIPMENT		3,000.00	
2. REPAIR AND SERVICING		200.00	
3. MINOR EQUIPMENT AND TOOLS		5,000.00	
4. RENTAL OF INSTRUCTIONAL EQUIPMENT		500.00	
5. OTHER CAPITAL EXPENDITURES		--------	
6. OTHER MAINTENANCE AND REPAIR		--------	
7. INSTRUCTIONAL MATERIALS AND SUPPLIES	TOTAL	$ 5,650.00	$
1. AUDIO VISUAL AIDS		2,000.00	
2. TEXTBOOKS AND REFERENCE BOOKS		150.00	
3. WORKBOOKS AND PAPERBACKS		500.00	
4. SUPPLIES AND MATERIALS		3,000.00	
8. OTHER COSTS NOT ELSEWHERE CLASSIFIED	TOTAL	$ 1,600.00	$
1. TUITION		--------	
2. TRAINEE TRANSPORTATION		400.00	
3. OTHER MISCELLANEOUS COSTS Uniforms and Cleaning		1,200.00	
9. OTHER THAN PROJECT		$ --------	$
10. TOTAL COST	TOTAL	$53,270.00	$
11. AMOUNT OF FEDERAL FUNDS INCLUDED IN LINE 10		$53,270.00	$
12. AMOUNT OF MATCHING FUNDS INCLUDED IN LINE 10		$ --------	$
COST PER TRAINEE HOUR $ 1.77			
TOTAL TRAINEES COMPLETING TRAINING (Number)			

STATE DIRECTOR, VOCATIONAL EDUCATION	DATE	COMMISSIONER'S REPRESENTATIVE	DATE

OE FORM [illegible], 7/63

ABSTRACT

The Boat Maintenance program is to provide trainees with the repair and maintenance of wood and plastic boats. General Education courses will also be provided where necessary for the unemployed, underemployed, and the disadvantaged. Special emphasis will be placed upon the proper use of boats and its effect upon the waters of the area.

Monmouth County has approximately 30 miles of ocean and two major rivers that run through the county. Pleasure boating is one of the major sports in the area, and the population of the county increases from approximately 400,000 to two million in the summer. The area will provide year round employment in the area of boat maintenance and rebuilding.

1. *General Information and Agreements*

1.1 Brookdale Community College.

1.2 Brookdale Community College, 765 Newman Springs Road, Lincroft, New Jersey 07738, (201) 842–1900.

1.3 Boat Maintenance Technician.

1.4 20.

1.5 52 weeks, 30 hours per week.

1.6 1 September 1970—1 September 1971.

1.7 If articles or materials are developed during this project, the disposition of all requested materials and services will be consistent with MDTA regulations.

1.8 I, Ervin L. Harlacher, President of Brookdale Community College, certify that employment of personnel and the purchase of goods and services will be conducted in accordance with all local State and Federal laws, requirements, regulations, and policies.

May 26, 1970.

ERVIN L. HARLACHER

1.9 I, Ervin L. Harlacher, President of Brookdale Community College, certify that Brookdale Community College will prepare a brief written evaluation of the instructional program which will include an assessment of: local administration; instruction; supervision; trainee achievement and placement; and, recommendations for improving the instructional program. These evaluations will be submitted to the State agency by Brookdale Community College within 30 days after the conclusion of the activities included in this plan or at such other times as required. Additional copies will be provided to other educational agencies, local State and other agencies upon request.

May 26, 1970. E. L. HARLACHER.

1.10 I, Ervin L. Harlacher, President of Brookdale Community College, certify that employees of Brookdale Community College who are reimbursed for services provided to MDTA activities will provide such services beyond their normal work day in accordance with MDTA regulations.

May 26, 1970. E. L. HARLACHER.

1.11 "I certify that this application will not be used to reduce expenditures for Vocational Education by the responsible training agency if MDTA activities are authorized.'"

2. *Course information*

2.1 *Objectives.*—The Boat Maintenance program is to provide trainees with the repair and maintenance of woods and plastic boats.

2.2 A. *Topical Outline of Major Units*

	Clock hours
Introduction to hand tools and materials	25
Hand tool skills	25
Principles of machine tools	25
Principles of boat construction	100
Boat repair—Wood	300
Boat repair—Plastic	300
Total	775

2.3 Evaluation of the trainee program will be based upon his ability to master the activities listed above. The objectives and subjective evaluations of the program will be developed by the instructor and trainees. The evaluation will be developed so that it is adaptable to programs operated on a regional basis and provide a measurement of the individual trainees progress.

[illegible] PART B

☐ Section [illegible] ☐ [illegible] ☐ Completed [illegible] ☒ Other (specify)

APPROVAL [illegible]

PROJECT NUMBER NJ

STATE New Jersey

DATE MAY 26 1970

NAME AND ADDRESS OF LOCAL PUBLIC TRAINING AGENCY RESPONSIBLE FOR THIS COURSE

Brookdale Community College, 765 Newman Springs Road, Lincroft, New Jersey 07738

NAME AND ADDRESS OF INSTITUTION OR AGENCY (Subsidiary) THAT WILL CARRY OUT THIS TRAINING COURSE

☒ Public ☐ [illegible]

OCCUPATIONAL TITLE: Inhalation Therapy Technician

DOT CODE NUMBER

☒ Budget estimate ☐ Budget revision ☐ Tentative final cost ☐ Actual cost

☒ Initial ☐ Repeat project ☐ Other (Explain)

PREVIOUS PROJECT NO.

			AMOUNT REQUESTED OR EXPENDED	FOR STATE AND FEDERAL USE ONLY AMOUNT APPROVED
3. FACILITY COSTS		TOTAL	$ 28,000.00	$
1. FACILITY CHARGES *(Include rent)*	@ $6.00 per sq. ft.		20,000.00	
2. UTILITIES *(Include telephone)*			5,000.00	
3. MINOR REMODELING			3,000.00	
4. ADMINISTRATIVE SALARIES		TOTAL	$ 18,804.00	$
1. ADMINISTRATION			-----------	
2. CLERICAL AND ACCOUNTING			-----------	
3. CUSTODIAL			7,500.00	
4. OTHER ADMINISTRATIVE COSTS			1,200.00	
5. EMPLOYER SHARE OF EMPLOYEE BENEFITS			10,104.00	
5. INSTRUCTIONAL AND EDUCATIONAL COUNSELING SALARIES		TOTAL	$ 84,200.00	$
1. SUPERVISORS SALARIES			-----------	
2. GUIDANCE COUNSELORS SALARIES			-----------	
3. INSTRUCTORS SALARIES	Certified Inhalation therapist		22,500.00	
4. OTHER INSTRUCTIONAL PERSONNEL			61,700.00	
5. TRAVEL			-----------	
6. EQUIPMENT		TOTAL	$ 77,000.00	$
1. MAJOR INSTRUCTIONAL EQUIPMENT			50,000.00	
2. REPAIR AND SERVICING			1,500.00	
3. MINOR EQUIPMENT AND TOOLS			25,000.00	
4. RENTAL OF INSTRUCTIONAL EQUIPMENT			500.00	
5. OTHER CAPITAL EXPENDITURES			-----------	
6. OTHER MAINTENANCE AND REPAIR			-----------	
7. INSTRUCTIONAL MATERIALS AND SUPPLIES		TOTAL	$ 24,800.00	$
1. AUDIO VISUAL AIDS			4,800.00	
2. TEXTBOOKS AND REFERENCE BOOKS			1,000.00	
3. WORKBOOKS AND PAPERBACKS			1,000.00	
4. SUPPLIES AND MATERIALS			18,000.00	
8. OTHER COSTS NOT ELSEWHERE CLASSIFIED		TOTAL	$ 2,800.00	$
1. TUITION			-----------	
2. TRAINEE TRANSPORTATION			800.00	
3. OTHER MISCELLANEOUS COSTS			2,000.00	
9. OTHER THAN PROJECT			$-----------	$
10. TOTAL COST		TOTAL	$ 235,604.00	$
11. AMOUNT OF FEDERAL FUNDS INCLUDED IN LINE 10			$ 215,604.00	$
12. AMOUNT OF MATCHING FUNDS INCLUDED IN LINE 10			$ 20,000.00	$
COST PER TRAINEE HOUR $	49.48			
TOTAL TRAINEES COMPLETING TRAINING *(Number)*				

STATE DIRECTOR, VOCATIONAL EDUCATION	DATE	COMMISSIONER'S REPRESENTATIVE	DATE

ABSTRACT

The general outlook for the Inhalation Therapy profession is very bright. Since the field is comparatively new, and expanding rapidly, the supply of qualified Inhalation Therapy technicians is far less than the demand. The primary purpose of the Brookdale Community College Inhalation Therapy Program is to provide an educational experience which prepares a safe and effective practitioner for the beginning levels of patient-care. The practitioner functions to the level of his educational preparation. The general education curriculum includes training in related and occupational education as well as remedial education, if needed.

This program is designed to encourage the unemployed, underemployed, and the disadvantaged, particularly those of the minority groups, who deserve an opportunity to better themselves and to rise to a higher socio-economic level in life. The philosophy of Brookdale Community College is to offer educational opportunities beyond the high school level to meet the educational needs of the people in the region which it serves.

In today's environment, air pollution control has become one of the greatest challenges to civilization. The dramatic increase of respiratory deficiencies and abnormalities only further focuses the danger of air pollution. Inhalation therapists are vitally needed to serve as auxiliaries to the medical profession. Inhalation therapy is one of these important specialties used primarily in the treatment of lung and heart ailments such as cardiac failure, asthma, pulmonary edema, emphysema, cerebral thrombosis, poisoning, drowning, hemorrhage, and shock.

1. *General Information and Agreements*

1.1 Brookdale Community College.

1.2 Brookdale Community College, 765 Newman Springs Road, Lincroft, New Jersey 07738, (201) 842–1900.

1.3 Inhalation Therapy Technician.

1.4 24.

1.5 30 hours per week for 2190 hours per individual. Projected daily schedule six (6) hours per day ranging from 7:30 a.m. to 10:30 p.m. depending on the program unit.

1.6 Trainees will be admitted to the program for approximately a year for a total of twenty-four trainees. Placement of trainees will be a responsibility of the program supervisor.

1.7 If articles or materials are developed during this project, the disposition of all requested materials and services will be consistent with MDTA regulations.

1.8 I, Ervin L. Harlacher, President of Brookdale Community College, certify that employment of personnel and the purchase of goods and services will be conducted in accordance with all local State and Federal laws, requirements, regulations, and policies.

E. L. HARLACHER.

May 26, 1970.

1.9 I, Ervin L. Harlacher, President of Brookdale Community College, certify that Brookdale Community College will prepare a brief written evaluation of the instructional program which will include an assessment of: local administration; instruction; supervision; trainee achievement and placement; and, recommendations for improving the instructional program. These evaluations will be submitted to the State agency by Brookdale Community College within approximately 30 days after the conclusion of the activities included in this plan or at such other time as required. Additional copies will be provided to other educational agencies, local, State and other agencies upon request.

E. L. HARLACHER.

May 26, 1970.

1.10 I, Ervin L. Harlacher, President of Brookdale Community College certify that employees of Brookdale Community College who are reimbursed for services and provided to MDTA activities will provide such services beyond their normal work day in accordance with MDTA regulations.

E. L. HARLACHER.

May 26, 1970.

1.11 "I certify that this application will not be used to reduce expenditures for Vocational Education by the responsible training agency if MDTA activities are authorized."

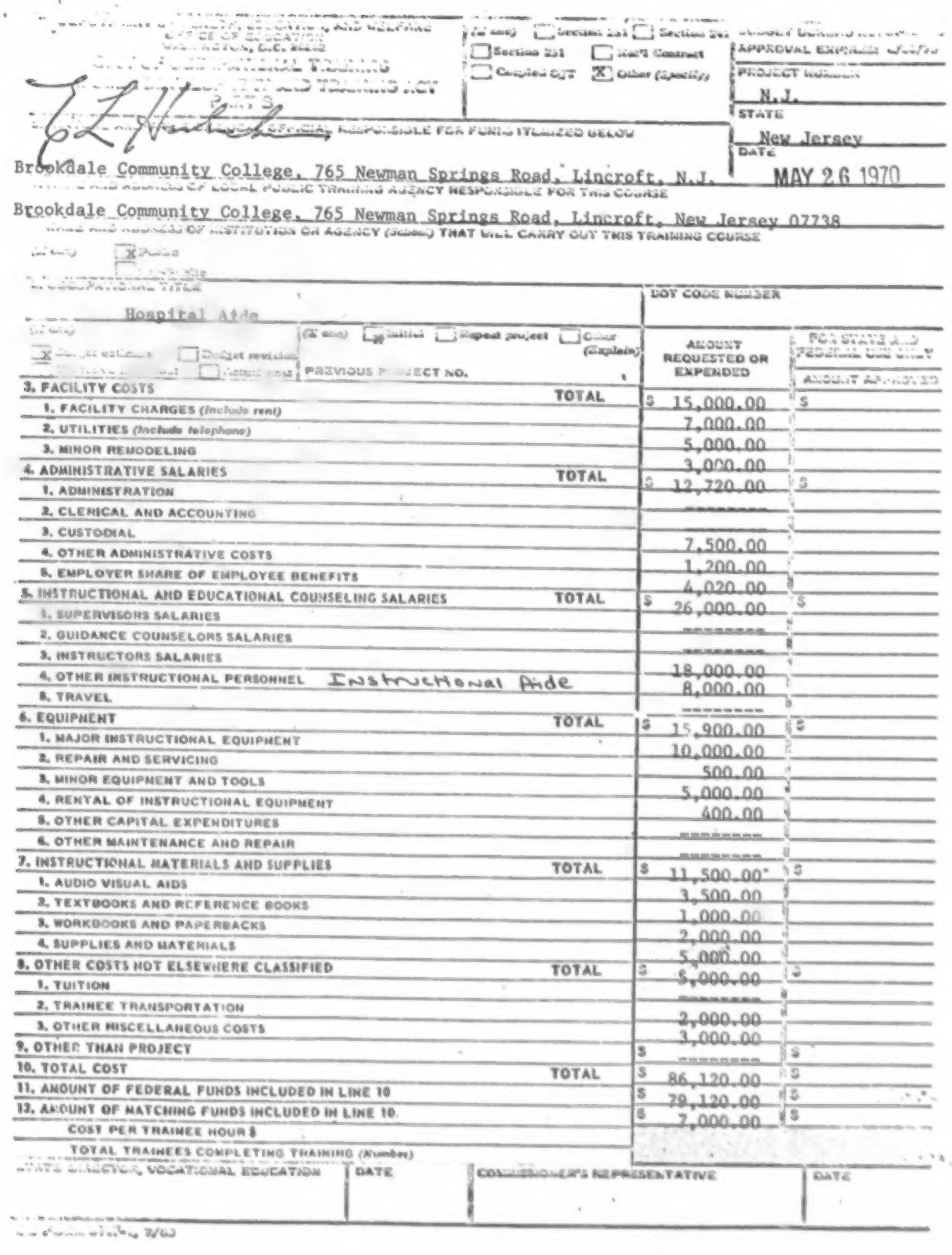
2. *Course Information*

2.1 *Objectives.*—This program is designed to provide the unemployed, underemployed, and the disadvantaged, particularly those of the minority groups with the opportunity to study and develop the skills and techniques necessary to become paramedical technicians in Inhalation Therapy.

2.2 *Topical Outline of Major Units*

	Clock hours
Orientation to inhalation therapy	15
Fundamentals of inhalation therapy	180
Anatomy and physiology	180
Introduction to inorganic, organic, and biological chemistry	90
Principles of physics	90
Applications and procedures of inhalation therapy	360
Pulmonary function	90
Microbiology	60
Introduction to pharmacology	60
Inhalation therapy internship	810
Total	1935

2.3 Evaluation of the trainee's progress will be based upon his ability to master the activities listed above. The objective and subjective evaluations of the program will be developed by the instructor and trainees. The evaluation will be developed so that it is adaptable to programs operated on a regional basis and provide a measurement of the individual trainees progress.



…, EDUCATION, AND WELFARE
OFFICE OF EDUCATION
WASHINGTON, D.C. 20202
… OCCUPATIONAL TRAINING
… DEVELOPMENT AND TRAINING ACT
PART B

(X one) ☐ Section 241 ☐ Section 241
☐ Section 251 ☐ Nat'l Contract
☐ Coupled OJT ☒ Other (Specify)

APPROVAL EXPIRES …

PROJECT NUMBER: N.J.

STATE: New Jersey

DATE: MAY 26 1970

… OFFICIAL RESPONSIBLE FOR FUNDS ITEMIZED BELOW

Brookdale Community College, 765 Newman Springs Road, Lincroft, N.J.
NAME AND ADDRESS OF LOCAL PUBLIC TRAINING AGENCY RESPONSIBLE FOR THIS COURSE

Brookdale Community College, 765 Newman Springs Road, Lincroft, New Jersey 07738
NAME AND ADDRESS OF INSTITUTION OR AGENCY (School) THAT WILL CARRY OUT THIS TRAINING COURSE

(X one) ☒ Public ☐ Private

OCCUPATIONAL TITLE: Hospital Aide

DOT CODE NUMBER:

(X one) ☒ Budget estimate ☐ Budget revision ☐ … ☐ Actual cost

(X one) ☒ Initial ☐ Repeat project ☐ Other (Explain)

PREVIOUS PROJECT NO.:

		AMOUNT REQUESTED OR EXPENDED	FOR STATE AND FEDERAL USE ONLY AMOUNT APPROVED
3. FACILITY COSTS	TOTAL	$ 15,000.00	$
1. FACILITY CHARGES *(Include rent)*		7,000.00	
2. UTILITIES *(Include telephone)*		5,000.00	
3. MINOR REMODELING		3,000.00	
4. ADMINISTRATIVE SALARIES	TOTAL	$ 12,720.00	$
1. ADMINISTRATION		--------	
2. CLERICAL AND ACCOUNTING			
3. CUSTODIAL		7,500.00	
4. OTHER ADMINISTRATIVE COSTS		1,200.00	
5. EMPLOYER SHARE OF EMPLOYEE BENEFITS		4,020.00	
5. INSTRUCTIONAL AND EDUCATIONAL COUNSELING SALARIES	TOTAL	$ 26,000.00	$
1. SUPERVISORS SALARIES		--------	
2. GUIDANCE COUNSELORS SALARIES		--------	
3. INSTRUCTORS SALARIES		18,000.00	
4. OTHER INSTRUCTIONAL PERSONNEL Instructional Aide		8,000.00	
5. TRAVEL		--------	
6. EQUIPMENT	TOTAL	$ 15,900.00	$
1. MAJOR INSTRUCTIONAL EQUIPMENT		10,000.00	
2. REPAIR AND SERVICING		500.00	
3. MINOR EQUIPMENT AND TOOLS		5,000.00	
4. RENTAL OF INSTRUCTIONAL EQUIPMENT		400.00	
5. OTHER CAPITAL EXPENDITURES		--------	
6. OTHER MAINTENANCE AND REPAIR		--------	
7. INSTRUCTIONAL MATERIALS AND SUPPLIES	TOTAL	$ 11,500.00	$
1. AUDIO VISUAL AIDS		3,500.00	
2. TEXTBOOKS AND REFERENCE BOOKS		1,000.00	
3. WORKBOOKS AND PAPERBACKS		2,000.00	
4. SUPPLIES AND MATERIALS		5,000.00	
8. OTHER COSTS NOT ELSEWHERE CLASSIFIED	TOTAL	$ 5,000.00	$
1. TUITION		--------	
2. TRAINEE TRANSPORTATION		2,000.00	
3. OTHER MISCELLANEOUS COSTS		3,000.00	
9. OTHER THAN PROJECT		$ --------	$
10. TOTAL COST	TOTAL	$ 86,120.00	$
11. AMOUNT OF FEDERAL FUNDS INCLUDED IN LINE 10		$ 79,120.00	$
12. AMOUNT OF MATCHING FUNDS INCLUDED IN LINE 10.		$ 7,000.00	$
COST PER TRAINEE HOUR $			
TOTAL TRAINEES COMPLETING TRAINING *(Number)*			

STATE DIRECTOR, VOCATIONAL EDUCATION	DATE	COMMISSIONER'S REPRESENTATIVE	DATE

… 7/63

ABSTRACT

The primary purpose of the Brookdale Community College Hospital Aide program is to provide the educational experience necessary to meet the minimal job requirements for employment in the fields of nurse's aide, emergency room aide, medical assistant, and dental assistant.

Selection of participants will be limited to the unemployed, underemployed, and disadvantaged. Wherever possible, minority groups, particularly those in the disadvantaged category, will be encouraged to participate.

The Hospital Aide program will be 20 weeks in extent. Eight weeks of the total program will be spent in pre-clinical studies in which remedial tutorial services will be available. The remaining twelve weeks will be spent in the clinical areas of general hospitals, geriatric centers, and areas of pediatric care.

A certificate of completion will qualify the successful participant for one of numerous jobs in area hospitals. In our home county of Monmouth three major hospitals are in operation and a new one is under construction. All of the existing hospitals are critically short of hospital aides. That desired portion of our environment, good community health, depends on the current availability of the above listed occupations.

Program adaptability to other areas within the region will be one of the prime criterion in program development.

1. *General Information and Agreements*

1.1 Brookdale Community College.

1.2 Brookdale Community College, 765 Newman Springs Road, Lincroft, New Jersey 07738, (201) 842-1900.

1.3 Hospital Aide And N/A.

1.4 40.

1.5 20 weeks at 30 hours per week per student per program. Total hours per program equal 12,000 hours.

1.6 This project will be held twice per year with a maximum of 20 students per training period.

1.7 If articles or materials are developed during this project, the disposition of all requested materials and services will be consistent with MDTA regulations.

1.8 I, *Ervin L. Harlacher*, President of Brookdale Community College, certify that employment of personnel and the purchase of goods and services will be conducted in accordance with all local State and Federal laws, requirements, regulations, and policies.

E. L. HARLACHER.

May 26, 1970.

1.9 I, Ervin L. Harlacher, President of Brookdale Community College, certify that Brookdale Community College will prepare a brief written evaluation of the instructional program which will include an assessment of: local administration; instruction; supervision; trainee achievement and placement; and, recommendations for improving the instructional program. These evaluations will be submitted to the State agency by Brookdale Community College within approximately 30 days after the conclusion of the activities included in this plan or at such other time as required. Additional copies will be provided to other educational agencies, local, State, and other agencies upon request.

E. L. HARLACHER.

May 26, 1970.

1.10 I, Ervin L. Harlacher, President of Brookdale Community College, certify that employees of Brookdale Community College who are reimbursed for services provided to MDTA activities will provide such services beyond their normal work day in accordance with MDTA regulations.

E. L. HARLACHER.

May 26, 1970.

1.11 "I certify that this application will not be used to reduce expenditures for Vocational Education by the responsible training agency if MDTA activities are authorized."

2. *Course information*

2.1 *Objectives.*—This project is designed to provide the hospital aide with the minimal qualifications for the following roles:

a. Assist in direct nursing care of the general duty category

b. Emergency procedures

c. Establish and maintain good communications with patients, families, agency personnel, and the community in such a way that it complements the occupational field

2.2A *Topical Outline of Major Units*

1. Introduction to Basic Patient Care
2. Introduction to Anatomy and Physiology
3. Allied Health Survey
4. Emergency Procedures
5. Maternal-Infant Nursing Aide Care

2.3 Evaluation of the trainee progress will be based upon his ability to master the activities listed above. The objective and subjective evaluations of the program will be developed by the instructor and trainees. The evaluation will be developed so that it is adaptable to programs operated on a regional basis and provide a measurement of the individual trainee's progress.

APPENDIX V.—A PROGRAM FOR DEVELOPING INTERCHANGEABLE TECHNICIANS IN ENVIRONMENTAL SERVICES

Twelve community colleges representing 160,000 students in the ten regions have committed themselves to providing the leadership necessary to meet the national vocational and ecological problems.

These community colleges have established an association for cooperative development and plan to obligate over six million dollars out of their operational budgets over the next three years to help solve environmental problems.

These colleges are prepared to assist in the development and implementation of state plans for environmental ecological education.

It is the "regional concept" that lines of communication be maintained and further developed between cooperating agencies and participating community colleges.

A PROGRAM FOR DEVELOPING INTERCHANGEABLE TECHNICIANS IN ENVIRONMENTAL SERVICES

Name of Training Agency.—Essex County College, 31 Clinton Street, Newark, New Jersey 07102. Area Code 201: 621-2200.

Training Facilities located at.—Main Campus: 31 Clinton Street, Allied Health Center: 375 Osborne Terrace, Adjunct Facilities: YM-WCA, 600 Broad Street, Beth Israel Hospital, Newark.

For further information about this project, contact Dr. Robert F. Mines, Dean of Institutional Development.

A Program for Developing Interchangeable Technicians in Environmental Services will be offered to 200 students drawn from the underprivileged, undereducated, unemployed, and underemployed residents of urban Newark and of Essex County, New Jersey. The career training programs will be designed to provide skills leading to immediate employment in technical jobs in four broad areas:

A. *Allied Health Technicians:*
  1. Family Health Worker
  2. Emergency Medical Technician
  3. Nursing Assistant
  4. Practical Nurse

B. *Scientific Technology Technicians:*
  1. Chemical Technician
  2. Biological Technician
  3. Pharmacy Helper
  4. Radiation Detection Technician

C. *Urban Social Services Technicians:*
  1. Playground Leader
  2. Social Welfare Aide
  3. Pre-School Aide
  4. Child Care Attendant

D. *Public Administration Technicians:*
  1. Data Processing Machine Operator
  2. Office/Clerical Assistant
  3. Rent/Taxes/Ticket Remittance Clerk

The participants in the program, following intensive counseling and career information, will elect to receive technical training for any one of the foregoing occupations. In addition, each participant will take basic education courses. The programs will run for 40 weeks.

This proposed program will serve to (1) improve the quality of the urban environment, (2) reduce unemployment and (3) expand educational opportunities.

The career training will be open end, flexible training. It is designed so that the graduate of one program can move readily from one technical area to another; there will be no dead-end programs. A variety of career options and job ladders are a part of this program and the total curricula of Essex County College.

Need for the program

This program looks at the environment in urban terms. People living within the heart of the city have demonstrated a deep discontent with the oppressive. dehumanizing urban environment. Within the city there is a population of underprivileged, undereducated, unemployed, and underemployed persons who could make a positive contribution to the improvement of the urban environment, as well as achieving a very personal pride and sense of accomplishment. This personal pride can come from successful participation in this program and the employment which would follow therefrom.

Regionality of the program

The program at Essex County College will benefit the entire region—New Jersey, New York, Puerto Rico, and the Virgin Islands. Newark has a greater concentration of urban problems and urban potential than any other city in the region. It provides employment opportunities in environmental services in a concentrated way. This project at Essex County College could serve as a model for other cities in the region.

Essex County College, in its brief two-year history, has developed a reputation as *the* New Jersey community college that is the most involved in regional planning and cooperation on a regional and national scale. Specifically, this program at Essex County College would benefit the region by (1) serving as a model of this type of urban project, (2) disseminating information, (3) preparing instructional materials in ecology, and (4) conducting appropriate research.

Essex County College will complement rather than compete with Brookdale College in environmental ecological education. The approach at Essex County College will be urban while Brookdale's approach will be suburban and rural. Already the two colleges are discussing the interchange of ideas, personnel, students, and information. These cooperating colleges are less than one hour's drive from each other.

Participating Students

Students recruited for this program would be selected from the underprivileged, undereducated, unemployed, and underemployed residents of urban Newark and Essex County, New Jersey. It is expected that the students participating will have the following general characteristics: (1) low reading ability; (2) member of a minority group—largely Black or Puerto Rican; (3) high school dropout; (4) welfare mother with depedents; (5) returning veteran. In addition, the age range within the group will be wide, 18–35.

The Project Agency

Essex County College is located at 31 Clinton Street in the heart of downtown Newark. The Allied Health Center is located at 375 Osborne Terrace, adjacent to Beth Israel Hospital, on Newark's south side. Three of the College's stated purposes are:

(1) To provide experience leading to civic responsibility, development of better human relations, and maximum realization of individual capacity

(2) To offer career programs which reflect the requirements of government and industry as well as the interests and aptitudes of students (Emphasis on students and on jobs)

(3) To provide opportunities for development and enrichment beyond the structured curriculum.

Essex County College already has several career programs in operation—one- and two-semester programs as well as two-year career programs leading to the

Associate in Applied Science degree. The job-ladder idea is a part of the College's curricula.

On the premise that no student should be deprived of an eduaction because of insufficient funds, the College has developed an extensive aid program to help students meet their college expense. One thousand students at Essex County College are recipients of financial aid. The average family income of the student body is $7,000.

Essex County College hopes to do much more for the underprivileged. This proposed program will bring a new group of learners to the college environment and merge them with other college students. The acquisition of environmental services skills will become a part of the college community. Essex County College can serve as the community's environmental and ecological center.

Occupational Titles of the Proposed Program

- A. *Allied Health Technicians:*
  - 1. Family Health Worker
  - 2. Emergency Medical Technician
  - 3. Nursing Assistant
  - 4. Practical Nurse
- B. *Scientific Technology Technicians:*
  - 1. Chemical Technician
  - 2. Biological Technician
  - 3. Pharmacy Helper
  - 4. Radiation Detection Technician
- C. *Urban Social Services Technicians:*
  - 1. Playground Leader
  - 2. Social Welfare Aide
  - 3. Pre-School Aide
  - 4. Child Care Attendant
- D. *Public Administration Technicians:*
  - 1. Data Processing Machine Operator
  - 2. Office/Clerical Assistant
  - 3. Rent/Taxes/Ticket Remittance Clerk

General Characteristics of the Proposed Program

1. The target student participants will be:
   - a. disadvantaged
   - b. undereducated
   - c. unemployed-underemployed
   - d. of minority groups
   - e. high school dropouts
   - f. welfare mothers with dependents
   - g. returning veterans
   - h. residents of greater Newark and Essex County
2. Student participants will be recruited by means of:
   - a. referrals from state unemployment offices
   - b. referrals from community agencies
   - c. referrals from high school
   - d. referrals from students recruiting other students
3. Intensive pre-counseling and continued counseling will take place to insure high level enrollment, participation, and success.
4. Intensive placement work will be done with businesses, state employment offices, government agencies, etc.
5. A child day care center will be available for children of the student participants (possibly serving as a training lab for urban social services).
6. Health checks will be required of the participants.
7. Advisory committees will function as an important part of the program.

Developmental Phases of the Proposed Program

The program will develop through four basic phases:

(1) Recruitment and Pre-Counseling (3 weeks).

(2) Basic Education and Guided Studies (16 weeks).

(3) Technical Training (16 weeks).

(4) Job Placement; Job Orientation and Coaching; Job Follow-Up (5 weeks), or

(5) OPTIONAL: Further training to a higher level.

Phase 1: Recruitment and Pre-Counseling: (3 weeks)

Recruitment of 200 learners who will be tested, interviewed, counseled, etc. Counselors and placement personnel will work with students, businesses, state unemployment agencies, hospitals, community agencies, government agencies, from the very beginning of the project to assure employment on successful completion of the program. (3 weeks)

Phase 2: Basic Education and Guided Studies: (16 weeks)

A. For Allied Health Technicians:
  1. Basic Reading/Writing Skills
  2. Science/Math Fundamentals
  3. Continued Intensive Counseling and Student Career Seminars

B. For Scientific Technology Technicians:
  1. Basic Reading/Writing Skills
  2. Science/Math Fundamentals
  3. Continued Intensive Counseling and Student Career Seminars

C. For Urban Social Services Technicians:
  1. Basic Reading/Writing Skills
  2. Social Sciences/Urban Problems Studies
  3. Continued Intensive Counseling and Student Career Seminars

D. For Public Administration Technicians:
  1. Basic Reading/Writing Skills
  2. Social Sciences/Urban Problems Studies
  3. Continued Intensive Counseling and Student Career Seminars

Phase 3: Technical Training: (16 weeks)

To avoid dead-end technical training and to provide for interchangeable technicians, much of the technical training will be applicable to several jobs associated with each of the four broad areas: Allied Health; Scientific Technology, Urban Social Services, Public Administration.

Approximately two-thirds of the training will be applicable to several jobs associated with an area. Approximately one-third of the technical training will be intensive, specialized technical training associated with a particular job. This technical training will be given under the supervision of practicing technical persons rather than academic personnel.

Essex County College has a dedicated faculty working on one-year programs for technicians. Several faculty members have a deep interest in recruiting undereducated persons and members of minority groups for the scientific technology field, and they have worked on these technical courses for one-year programs in scientific technology. Materials have been developed and tested on technical courses in allied health and urban social sciences technology. Courses appropriate for public administration technicians already exist in the College and could be used in this project with only slight alteration.

Phase 4: Job placement, job orientation and coaching, and job follow-up constitute Phase 4 of this program. Further training and career guidance are optional at the completion of Phase 4 of the project.

If articles or materials are developed during this project the disposition of all requested materials and services will be consistent with MDTA regulations.

I, J. HARRY SMITH, Vice President and Chief Executive Officer of Essex County College, hereby certify that employment of personnel and the purchase of goods and services will be conducted in accordance with all local State and Federal laws, requirements, regulations, and policies.

J. HARRY SMITH.

May 25, 1970.

I, J. HARRY SMITH, Vice President and Chief Executive Officer of Essex County College, hereby certify that Essex County College will prepare a brief written evaluation of the instructional program which will include an assessment of: local administration; instruction; supervision; trainee achievement and placement; and, recommendations for improving the instructional program. These evaluations will be submitted to the State agency by Essex County College within approximately 30 days after the conclusion of the activities included in this plan or at such other time as required. Additional copies will be provided to other educational agencies, local State and other agencies upon request.

J. Harry Smith.

May 25, 1970.

I, J. HARRY SMITH, Vice President and Chief Executive Officer of Essex County College, hereby certify that employees of Essex County College who are reimbursed for services and provided to MDTA activities will be provided such services beyond their normal work day and in accordance with MDTA regulations.

J. Harry Smith.

May 25, 1970.

BOB 51-R400
EXP. DATE 6/30/70

DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
Office of Education
Washington, D.C. 20202

FORM OE 3117-1
PART B

COST OF OCCUPATIONAL TRAINING
MANPOWER DEVELOPMENT AND TRAINING ACT

(X ONE)
☐ Section 231
☐ Section 241
☐ Section 251
☐ Nat'l Contract
☐ Coupled OJT
☐ Other ______

PROJECT NO.
STATE
Date: ______

(Signature and Title of local official responsible for funds itemized below)

1. Name and Address of Local Public Training Agency Responsible for This Course
ESSEX COUNTY COLLEGE, 31 Clinton Street, Newark, New Jersey 07102

Name and Address of Institution or Agency (School) that will carry out this Training Course
(X One) ☒ Public
☐ Non-Public

2. Occupational Title
See Page 1 of Proposal

DOT Code No.

(X One) ☒ Budget Estimate
☐ Budget Revision
☐ Tentative Final Cost
☐ Actual Cost

(X One) ☒ Initial
☐ Repeat Project
☐ Other (explain)
Previous Project No. ______

		Amount Requested Or Expended	For State & Federal Use Only Amount Approved
3. FACILITY COSTS	TOTAL	$	$
1. Facility Charges (Incl. rent)			
2. Utilities (Incl. telephone)			
3. Minor Remodeling			
4. ADMINISTRATIVE SALARIES	TOTAL	$ 484,630	$
1. Administration Director of Program		19,000	
2. Clerical and Accounting (3)		17,000	
3. Custodial			
4. Other Administrative Costs 35% of Other Costs $1,281,800		448,630	
5. Employer Share of Employee Benefits			
5. INSTRUCTIONAL AND EDUC. COUNSELING SALARIES	TOTAL	$ 500,000	$
1. Supervisors Salaries (3) Placement Officers		36,000	
2. Guidance Counselors Salaries (10)		120,000	
3. Instructors Salaries (30)		344,000	
4. Other Instructional Personnel			
5. Travel			
6. EQUIPMENT	TOTAL	$	$
1. Major Instructional Equipment			
2. Repair and Servicing			
3. Minor Equipment and Tools			
4. Rental of Instructional Equipment			
5. Other Capital Expenditures			
6. Other Maintenance and Repair			
7. INSTRUCTIONAL MATERIALS AND SUPPLIES	TOTAL	$ 75,000	$
1. Audio Visual Aids		25,000	
2. Textbooks and Reference Books		15,000	
3. Workbooks and Paperbacks		15,000	
4. Supplies and Materials		20,000	
8. OTHER COSTS NOT ELSEWHERE CLASSIFIED	TOTAL	$ 670,800	$
1. Tuition 200 Trainees		70,800	
2. Trainee Transportation			
3. Other Miscellaneous Costs Stipends:$75x40weeksx200Train		600,000	
9. OTHER THAN PROJECT			
10. TOTAL COST	TOTAL	$ 1,730,430	$
11. AMOUNT OF FEDERAL FUNDS INCLUDED IN LINE 10		$ 1,730,430	$
12. AMOUNT OF MATCHING FUNDS INCLUDED IN LINE 10		$	$

Cost Per Trainee Hour $5.41
Total Trainees Completing Training No. 200

State Director, Vocational Education ______ DATE ______

Commissioner's Representative ______ DATE ______

GSA DC 69.11911

Mr. Brademas. Thank you very much, Dr. Ambry——

Dr. Ambry. I hope you were able to listen as fast as I had to talk.

Mr. Brademas (continuing). Especially in respect to your specific recommendations.

Do you have any comment on the locating of the specific authority for the bill in the office of the Commissioner of Education?

Dr. Ambry. Yes, in my testimony I say I agree with all of the statements except one.

I am a little concerned that we are not strengthening up the local 50 State departments of education. It seems to me in the wording of the bill you call for the U.S. Commissioner of Education to receive proposals and then to inform the local State departments of education.

I would like to see some statements in the bill to allow the State departments of education a stronger role in determining what might be funded.

Mr. Brademas. Now by that you feel that the State departments of education should receive the applications from local school systems and pass on them?

Dr. Ambry. I think I might go that far, yes.

Mr. Brademas. That distresses me very much. How many Dr. Ambrys are there in the State departments of education in the United States?

Dr. Ambry. I think there are more now than there were 2 or 3 years ago.

Mr. Brademas. That's a safe statement.

Dr. Ambry. I am feeling more dependent on them recently since the title III shifted to the State level.

I begin to see emerging in many of the States a little more concern, a little more in-put and a little more contact with what is going on.

In the past, under title III, several projects were funded without the State departments of education knowing they were coming into existence, only to the distress of finding out from a local school district or school board that it had submitted a proposal.

I would like to see some kind of a plug-in at the State level.

Mr. Brademas. The reason I am dubious of your suggestion is because it goes of course far beyond the environmental education bill.

Would there were Carl Marburgers in every State department of education of the union. But that is not the way the world is, as I am sure you know, and I was one of those who was not only opposed but militantly opposed to giving control over title III projects to the States, although at the same time I was a strong supporter of increasing funds for title V of ESEA in order to make civilized State departments of education, most of which you can say for the record is pretty poorly planned.

At any rate I appreciate your suggestion which I think we ought to do to some degree, strengthen the role of the State agencies in the field of environmental education.

I suppose it would be true to say, and on this you might comment, that very few States provide any substantial moneys earmarked for environmental education.

Dr. Ambry. Yes; this is true and this is probably behind my suggestion.

By building it early enough into the game, they may be forced to do this and in the master plan for New Jersey that I just submitted to you, we are calling for a $500,000 act to be passed by the Legislature of New Jersey—it is also called the Environmental Quality Education Act of New Jersey—which would give the kinds of funds you are calling for.

Mr. **Brademas.** I would like to commend you and the Governor of New Jersey on that kind of enterprise. I would like to see that replicated across the country.

What about teacher training? From your own position what do you think we can do? What do you think ought to be done in the way of training school teachers in this field?

Dr. **Ambry.** One of the things, and I have made a very specific recommendation in the prepared testimony, that two or three words be added to one section of the act where you are calling for workshops so there would be some support for followup consultancies and followup activities.

I have been in this game long enough to know, if you get a group of teachers together and you inject them with environmental education techniques and know-how and they then disappear off the scene to go into a workshop on drug abuse and another workshop the following week on sex education, all of these injections and techniques don't seem to have a lasting followthrough in working with teachers over a long period of time.

I am not in favor of sponsoring short-term workshops.

Mr. **Brademas.** That's a very telling idea. Do you support adult community workshops and discussion centers to develop interest in the community?

Dr. **Ambry.** Yes; we are doing that in Jersey. In this way we get the necessary community involvement in the problems associated with environmental quality.

We don't get any place without community support.

Mr. **Brademas.** My last question concerns something you have touched on, cooperation of the school system and universities in the State, in helping them strengthen their capacity for offering environmental courses via a teacher training or curriculum development.

Does Princeton help the school systems of New Jersey or not?

Dr. **Ambry.** Well, you picked on the one that does. Princeton very definitely does.

We have about 40 colleges in the State of New Jersey and very few of them know what we are talking about on environmental education.

I have taken a dig at the colleges in my testimony. I am not digging at the kind of things that were said before, the kind of environmental science studies to develop an approach to the monumental problem we have.

I think you will get university support there.

But what I am saying, in the prepared testimony, is that for the average college professor, when we are talking about environmental education, talking about getting out and working with the youngsters and schools; the universities and colleges are simply not plugged into this area of concern.

First of all in college circles, and I have been in them for 20 years—there is a reward, a gradation system. It is linked to a specialty and it behooves you to stay in your specialty and it doesn't behoove you to get out into the community and work with educators and people.

So I am not sure, as you call in your bill for colleges and universities across the country to vie for this money, that you can count on their support.

Mr. Brademas. Thank you very much. Your testimony has been very helpful.

Mr. Reid?

Mr. Reid. Thank you very much, Doctor. I think your testimony has been very helpful and very immediate.

You allude to need for hrlp under title III, for some retrieval and non-duplication of those projects.

Do you have any idea what those projects have shown or developed?

Dr. Ambry. I think there are two or three people in the country that have probably collected as much of the material as has been generated.

Much of it is good. Much of it is repetitious of things which have been tried out in other areas.

I think what I would like to do as quickly as possible would be to put all this material in one warehouse somewhere and to bring in a group of people who could filter through it and stack it in piles—this is good stuff—bad stuff— this is extremely good—and quickly develop some models.

I would say a timetable on something like that could be done by the end of the summer.

But it simply hasn't been done. There is no one place that has been charged with the responsibility of collecting this data.

Mr. Reid. One final question. What are the problems as you see them in the classroom with the teacher and the student—and they are somewhat different—in environmental education?

What are the difficulties? What are the special kinds of things that need to be done in order to motivate the student, if necessary, to get him involved, show him relevance and so on?

Dr. Ambry. I had a friend who said someday he will wake up and find all the schoolbuses going in the other direction and then we will have environmental education.

I don't think, as stated by Mrs. Weisberg, that this will work only in the classroom. I think you have to have activities outside the classroom. I don't rule out the use of mass media and television through which we can evolve some new techniques in the classroom also.

We are preparing a teaching unit on thermal pollution in New Jersey. We have flown by helicopter over some of the polluted metropolitan areas, we have prepared a film loop, and we have some video tapes. A teacher could, in five one and a quarter hour sessions by pretesting the youngsters on Monday and post testing on Friday afternoon, use this unit to develop in these youngsters an understanding, at fourth grade level, of environmental thermal pollution.

We hope to develop this unit for the eighth grade level and the 12th grade level.

There are some teaching units that could be developed for all classroom levels but I think they would have to be tied into field trips such as Mr. DeLury and others have mentioned.

Mr. Reid. Thank you very much.

Mr. **Brademas**. I would like to say in my own judgment what you have been doing in the State of New Jersey is at least in part what I hope this bill would encourage and stimulate and make possible for other States and communities across the country to do, and I invited you to testify because I was so impressed with the letter that you originally sent me when I invited your comments on this, and I want to reiterate my appreciation to you and that of my colleague, Mr. Reid, for having come.

Dr. **Ambry**. Thank you.

Mr. **Reid**. Thank you.

Mr. **Brademas**. The Chair wants to observe we have two more witnesses here and I believe that Mr. Monserrat must leave in about 10 minutes.

Would Mr. Fabricant mind?

Mr. **Fabricant**. Not at all, Mr. Chairman.

Mr. **Brademas**. Since you both work for Mayor Lindsay, perhaps an outsider can make that suggestion.

Mr. Monserrat, if you would like to come ahead I would like to suggest that it would help if you simply summarize your statement if you can, and that that will enable Mr. Reid and I to put questions to you.

REMARKS OF JOSEPH MONSERRAT, PRESIDENT, BOARD OF EDUCATION, NEW YORK

Mr. **Monserrat**. I am very pleased to be here. I hate to start out this way but I don't work for Mayor Lindsay. The education unit is still a State unit.

I have great admiration for the mayor, but I must for my colleagues and myself maintain our independence.

I think I could sum up what I try to say in this statement in a very brief way, because it is quite simple. Perhaps the most difficult job that we have to do is one which I believe that this bill might help, and I want to start by expressing our complete support for the proposed bill.

I don't believe that we are ever going to succeed in any kind of environmental control; I don't believe we are going to succeed in resolving pollution and all the various other problems; I don't believe we are even going to succeed in educating children until and unless we begin now by educating young people about the miracle and the importance of life.

I believe we live in a society where death is taken so much for granted. Because death is so taken for granted, we are not concerned about the things that pollute our air or kill our wildlife or kill us.

So I would say that, unless we can and do teach our young the miracle of life and the miracle of their individuality and the fact that in all the eons of time past, and in all of the time to come that they are unique and there will never be others like them, and until we can create this wonder about life, I don't believe we are going to stop the processes of death.

And this is what I try to say in this brief text of mine, that I believe, as one involved in education, that this act can help create a broader concept of what we mean by the control of the environment.

I don't think that any of the programs we have can really catch hold until we create a true belief in the miracle of life.

I am not a preacher. I am not a minister. But I go around seeing too many dead young people.

I see little old men and little old women with no life in their eyes at ages 6 and 7 and 8.

I see too many people too concerned and too blase almost about death around them and I really believe this bill, if properly expanded, will refute those critics who denigrate the concern for the environment by labeling it political and all the things that go into it.

I think we must be concerned with the carbon monoxide from cars. I think we also have to be concerned with the slums in which the cars are sending forth the carbon monoxide.

I think we have to be concerned with mountains and with hills and with rivers and with fish, but I think we have got to be just as concerned with the children and with the people in our surroundings.

It is nice for a child to dream of rolling hills and beautiful sparkling streams that he will never see.

So for me your bill represents something much bigger and much, much broader than the more pragmatic discussion around.

I may sound like an idealist, but I think the reading of history taught me a long time ago that the only people who have had immortality have been the idealists, because the practical people of their day died the day they died.

We remember Pontius Pilate only because of Jesus Christ and therefore I am not afraid to say that I believe constantly our task can be really doing the job of—and must be—creating a belief in children in themselves, in their own miracle of being alive.

And once we create a concern and wonder for the beauty of life, I think we will be in a position to take the kinds of action about which people are indifferent only because they are indifferent to life.

Mr. BRADEMAS. Thank you very much, Mr. Monserrat. That's a most eloquent statement and I congratulate you on it.

It seems to me you have very well caught the fundamental purpose that caused Mr. Reid and me and some of our colleagues to introduce this bill and I might say to you on the first day of our hearing we invited both a theologian and an artist, a painter, to testify about the bill precisely because of the condition you were here talking about, the fundamental human values of which you have just spoken in such moving terms.

I have just one question. As president of the board of education do you find an increasing interest in the kind of educational programs we are talking about here in the New York City schools?

Mr. MONSERRAT. Yes, sir, I think there is a growing interest, I think there is a great deal of concern.

Part of the concern may not be described in terms of the bill, but certainly the fright from the so-called drug epidemic and all that surrounds it, has created a movement toward the kinds of things which would develop such a program.

I think that the concern with outdoor programs—again appearing to be critical, but not being really critical—I think projects in which I have seen children going out into the streets and into the highways and taking pictures of their environment and really beginning to understand something about garbage collection and dirt and detergents and beginning to discuss these things are awakening them, in a different way, to the kinds of things that we are discussing here.

And I would say we would more than welcome the opportunity for being able to help to provide some of the resources to really enrich these programs and make them much more meaningful.

It is necessary, not just desirable.

Mr. Brademas. Thank you.

Mr Reid?

Mr. Reid. I want to welcome you and thank you very much.

I was struck by the poignancy and force of your eloquent testimony, and I would submit, along with you, that many in the slum and ghetto areas of New York, the residents, never virtually see a tree or dream of a clear mountain stream, let alone a fish.

I think what you said about looking into the eyes of little old men and women aged 6 or 7 with no life in them is very accurate and a very devastating commentary on the failure of our society to provide real hope and freedom for many Americans.

What I would really like to ask you very simply is what kind of curriculum and materials do you now have in the New York City school system and what kind of things do you think would be helpful particularly in view of the fact that you would like to move our schools out into the countryside?

Mr. Monserrat. The New York City Board of Education has been described as the world's 12th largest corporation.

Mr. Reid. My compliments to you.

Mr. Monserrat. To be specific, in terms of the details you ask me I would have to bring some staff people along because I wouldn't begin to attempt to think that I know the answer.

I have seen some of the material that was taught and is being taught in the health-education field, social science field. I have seen some material in relation to population and overpopulation.

I have seen some of the materials dealing with preservation and things of this sort.

But I still feel, you see, that somehow or other this material and the use of this material is secondary to what I believe is the basic lesson we must teach children, and I don't find that anywhere in any school system do we teach children anything about the wonder of themselves and we don't teach children to believe, as I say, that they are unique and that they are a wonder and that they are a miracle, and I believe that until we can do this, until we can really make youngsters believe in the importance of themselves, all of these other things which we attempt to do are sort of secondhanded.

And I think we've got to really come down to a much more simplistic concept of the meaning of life, and I believe that once we begin to understand that, then everything else that has a negative effect on it will begin to take on the kind of importance and meaning which many people have for many years been trying to tell us about as they tell us about pollution and population.

And you can go right down the list and somehow or other we hear but I don't think we really hear fully enough to be able to respond to in the way we should like to.

And it is in some of these areas that I personally would like to see more thought and more work done.

I am sure that our professional staff could outline very quickly and I would be more than willing to provide the committee with such information, a list of the kinds of materials we have and, more important perhaps, the kind of material that we would need and the kinds of programs that would be needed and which could come about as a result of this act.

Mr. REID. Well, I am sure the chairman and I would be very appreciative if you could supply that list and also if you would take a look at the bill and see if there are any technical additions that might be relevant from the curriculum standpoint and, finally, just to add, I agree with you on reverence for life and the wonder of being alive and the wonder of life, convincing children of this; George Wald has done something on this, and I was struck the other day in looking at the age of the earth and moon.

We have lived here really for a very short span and it takes 500 years even to produce an inch of good top soil, yet we are in a matter of months destroying life, destroying something that has really taken billions of years to develop, and the wonder of life and the wonder of the child.

Thank you very much.

Mr. MONSERRAT. Thank you.

Mr. BRADEMAS. Thank you very much, Mr. Monserrat.

(Prepared statement of Mr. Monserrat to be inserted at this point.)

STATEMENT OF JOSEPH MONSERRAT, PRESIDENT, BOARD OF EDUCATION

Thank you for this opportunity to speak out on the need for education about the preservation and improvement of our environment. I want to start by expressing my complete support for the proposed Environmental Quality Education Act.

I hope that the current concern for our surroundings, both man made and natural is not merely a passing fad. It would be tragic if it were so. The way we have treated our natural environment and the way we have created our manmade surroundings reflect the fundamental ills of our society. I cannot agree with those critics who denigrate the recent popular concern for "environment" by labelling it "political" or who regard it as an attempt to turn our focus away from other pressing economic and social issues. Pollution, inability to handle natural and man-made wastes, over-population, urban blight, and the desecration of our nation's spectacular natural beauty are all symptom of other moral, social and economics ills. Educating our young as to the nature and future of our total environment is a forceful way to increase a needed awareness and understanding about the fundamental problems which face us.

I would like to speak to the issue before us from two perspectives: As President of the New York City Board of Education and as a member of the Puerto Rican community.

As President of the Board of Education, I think the passage of the Quality Environmental Education Act will help fulfill the following aspirations: First, adults, and perhaps more important, our children must learn what "environment" means. Much of the popular discussion stresses pollution and the need to preserve and use our natural resources with safety. However, this should be only part of the total focus. Environment consists of all that man does *with* nature and all that man has created for himself *from* nature. I think that in an educational program we should look at the environment from the standpoint of ecology as a whole. We should take as a model that which scientists have learned from their study of other organisms and how they provide for themselves in their natural habitat and how they survive in the niches they have created.

We must teach adults and children that houses, streets, stores, highways and machines are part of the environment; that poverty and the slums in which many of our urban children grow up and play, are symptoms of a failure to use what nature has given us, in a humane way. We must demonstrate that the means we now use to get from one place to another, the use of cars and the misuse and collapse of public transportation, are all signs that man, with all his creative powers, has failed dismally to use his gifts to help his fellow men. Too many children respond to the issue of "environment" with a mental picture of rich rolling hills, lovely streams and stunning mountains—all fantasies to the many children who have never seen and will never be able to see or live near such splendor.

I think that a program of environmental education should be introduced on all levels and geared toward a systematic understanding of man's relationship, both biological and *social* to his surroundings in terms of the total human condition. This means teaching, as you have proposed, in the mass media, in the community and in the classroom, the old and the young, to understand the relationship between mountains and cities, air and cars, water and the food we buy—the connection between resources and our use of them, between potential and failure, between healthy livable space and poverty stricken slums.

Second, education about the environment should inspire the young to solve those important problems beyond the more theoretical and all-inclusive scope I have just outlined. These problems are most familiar to us all and are the probable cause for the gathering here today. New ideas must be found to end pollution of air and water, and to dispense with the avalanche of man-made waste in a way that will not harm us. Environmental education should bring the young to an awarenes which we, in our generation, never had about the population explosion. New ways to help regulate and distribute the human part of the environment must be found, ways which avoid the political connotations which have continually plagued concern over the demographic future of man.

Third, the increase in awareness about our environment should lead to the better use of our surroundings in the near future. Through the programs and materials which can result from the proposed legislation, the progress of decay may be halted sooner than expected. This goal may be best realized through the mass media and community and adult education.

To conclude, as President of the Board of Education, I support the Environmental Quality Education Act because it will help broaden and deepen the understanding of the patterns of man's existence and because it may help us solve the ominous problems which are before us in 1970.

But there is a further reason why I support this Act. I support the Environmental Quality Education Act as a member of a "minority group" which has been "disadvantaged". I grew up with personal knowledge of how an environment can crush a people's spirit, dash their hopes and reduce them to an object of hate, fear and pity. Unfortunately, nationwide concern for the environment comes only when pollution and decay threatens a larger portion of our nation: those who have not been confined to the urban slums which have existed since cities themselves. But it is not too late or too soon. As a Puerto Rican, I hope that the program for education about the environment will ultimately turn the concern of our citizens to the condition of their fellow men.

The environmental crisis before us reflects the failure to use our surroundings to benefit each other. Concern and understanding about the environment must lead to the solution of the problems of our cities and the problems of the poor. Concern for the environment cannot be separated from concern for men. The solution to the problems of our environment must, by definition, include the elimination of slums and the elimination of poverty because these are the most painful tragedies which have resulted from a misuse of nature *and* man, and they continue to destory our environment. If our nation really solves the environmental problem, it will have helped to solve the basic moral problem beneath all the crises we face in our nation at this time. This moral problem is the on-going struggle of men among and with themselves; the translation of hate, envy and greed into reality. As a Puerto Rican, I see the national concern for the environment as part of a movement which will eventually better the economic and social position of our national minority communities and improve the physical and emotional conditions in which they live.

In closing, I want to express my complete support for your Bill as a crucial step. Quality environmental education will be part of the groundwork behind a better environment and part of the total role that education must effectively and powerfully play in the creation and preservation of a pluralistic democracy in a nation as large as ours and torn by so many different currents.

Environmental education, however, has its own special purpose: to help insure the future survival of our planet and of man himself.

Thank you.

Mr. BRADEMAS. Our final witness today is Mr. Neil Fabricant, general counsel of the Environmental Protection Administration of the city of New York.

Thank you very much for being with us.

STATEMENT OF NEIL FABRICANT, GENERAL COUNSEL, ENVIRONMENTAL PROTECTION ADMINISTRATION

Mr. FABRICANT. At the outset, Mr. Chairman, I would render some apologies for my lateness and the absence of Xerox copies.

Mr. Kretchner had intended to testify but his legislative duties kept him in Albany and I was pressed into service rather late.

With that, I will be very brief. My only professional background is that of a civil liberties lawyer, and I would like to speak to your bill through that perspective.

I think we are at the beginning of a civil rights movement in the environmental area in this country, and, unlike that movement I think we are all environmentally oppressed.

While there may be angels and devils with respect to this issue, I don't think nature is going to draw that distinction.

If we are unable to reverse ourselves, there is going to be no escape to the suburbs for any of us.

Let me press the civil rights analogy further. Like the Federal Government which dissipates our resources on military spending and corporate welfare, civil rights and civil liberties organizations have misallocated their own resources.

Enormous sums of money have been spent on litigation programs which in the final analysis have accomplished very little. Relatively small amounts of money have been allocated toward sustained educational programs.

As a result of that I don't think we would have the constituencies to support a civil rights and civil liberties movement in this country and that tragic lack has undermined all civil liberties and civil rights programs.

We have learned one thing, that a court that ventures too far beyond what the public has been prepared to accept educationally, that court will lose the broad base of support which will enable it to act and which underlies its very legitimacy.

That's why I think your bill and your approach is so very critical in this area.

Our environmental problems have only reached broad public concern within the last couple of years.

Until then I think we have operated under a mythology and that mythology is expressed in our history books, our philosophy, and in our art, and that is that man conquers nature rather than being an extension of nature.

And I think that is at the heart of some of our problems.

Just parenthetically, my wife pointed out to me one day that in oriental painting, for example, in Japanese painting, you see small men against a backdrop of huge mountains and churning seas, and it is quite the opposite with respect to our literature, our art, and our painting.

That kind of crystallizes the issue to me. It is the way we think about ourselves that is at the root of this problem.

I think if we survive we are not going to be able to do so while indulging in the luxury of that mythology.

The environmental issue has become very popular. Vast numbers of bills have been introduced to combat this or that form of pollution. I am concerned that it is just a fad. If it is a passing fad, another issue will take its place. Again, however, like the civil rights movement, the issue is not going to disappear. It is just going to become more difficult to resolve and the stakes a lot higher.

That's why I think your approach is critical. We have to begin a massive and sustained educational campaign right now which will build that constituency which will permit the courts and legislature to respond in the way it should be responding.

We have to begin in the public schools so judges can't be produced 20 years from now who are going to view pollution problems as some kind of minor white collar crime that doesn't deserve the kind of sanctions we feel should be imposed for that kind of pollution, that kind of serious crisis.

A concrete illustration is the asbestos spray area where we have known for some time that asbestos spray causes a serious health hazard.

The relationship between that and lung cancer is as serious and high, as clearly demonstrated, as that between cigarette smoking and lung cancer.

We just issued a set of regulations to take effect Monday, the most stringent I think in the country which are carefully going to restrict the way fireproofing material is applied in on-going construction jobs.

That should have been done a long time ago. I don't know how many lives were lost as a result of the failure to act.

Had the public been educated to the problems sooner, I think we would have gotten swifter action.

In the past 2 months I have listened to a lot of industry arguments which center around the cost of pollution abatement and perhaps my approach is too simplistic.

But those arguments just remain unpersuasive to me. I think a burglar would not be heard to argue that the cost of curtailing his activities would be just too high for him and that his activities could not be restricted.

While we don't see the causal relationship between pollution problems and public health and property damage as clearly as between burglary and loss of property, that causal relationship is there and, as the technology builds up, we are going to find through your bill and others like it that that causal relationship is very clear.

When the public becomes educated through your bill and the media and hearings such as this, I believe a very pristine approach to environmental problems is going to be vindicated, that approach that doesn't balance competing economic interests, but that which takes the pure public health view.

Because I am persuaded that the problem is just too urgent to leave to future generations to resolve, I am really heartened by the specific provisions in your bill that provide for industrial and adult education. I think those are critical because I think the problem is that argument.

The tunneled vision which sees the short-run profit and doesn't see the long-run disaster I think is also at the heart of this problem and that can only be overcome through public education I think.

I have only one final observation. Your bill speaks in terms of ecology. When I think of pollution I think rats, blights, pollutiton, everything that pollutes the cities' atmosphere.

And I think we have our own peculiar ecological problems and balance and I think we have to strike that balance and live with man and man with nature and strike that very delicate ecological balance.

So I hope the programs that are going to be implemented under your bill are going to focus on the cities' problems, as opposed—not opposed, because I think David Sive's problems are our problems as well—but concentrate on the cities' problems and those educational programs that you envision under this bill will concentrate on those problems, the environmental as opposed to the ecological problems.

Lastly, as one of the other speakers mentioned, something along the same lines, what I would propose is an environmental college. I think we would need a system of all of these problems under one roof, because that's the only way these problems can be resolved.

The results of one piece of technology can never be seen without the approach of all those disciplines involved and I think right now we have very few environmentalists, very few laywers like David says, very few scientists interested in the country, and I think an environmental college studying municipal ecology as well as the problems that David Sive raises would be a fundamentally important thing and I recommend it for your consideration.

With that I will end my remarks.

(Mr. Fabricant's statement follows:)

STATEMENT OF NEIL FABRICANT, GENERAL COUNSEL, ENVIRONMENTAL PROTECTION ADMINISTRATION

Mr. Chairman, members of the Committee, my name is Neil Fabricant. I am the General Counsel to the Environmental Protection Administration, the agency charged with the responsibility of overseeing New York City's air, water and sanitation departments, and more generally of protecting the city's environment.

My own professional background is mainly that of a civil liberties lawyer and I would like to speak to your bill, Mr. Chairman, from that perspective.

We are at the beginning of an environmental civil rights movement in this country. Unlike the civil rights movement, however, we are all environmentally oppressed. While there may be angels and devils with respect to this issue, nature will not draw those distinctions. The cities are in the midst of an environmental crisis. If we are unable to reverse ourselves, there will be no escape to the suburbs for any of us.

Let me press the civil rights analogy a bit further. Like the federal government which dissipates our resources on military spending and corporate welfare, civil rights and civil liberties organizations have misallocated their own resources. Enormous sums of money have been spent on litigation programs which in the final analysis have accomplished very little. Relatively small amounts of money have been allocated towards sustained educational programs; with the result that if a popular referendum were to be held today, at least some portion of our Bill of Rights would vanish. This tragic oversight has seriously undermined the ambitious legislative and litigative programs undertaken by these organizations. While courts and legislatures can educate, this function must be the primary responsibility of education institutions.

The one stark lesson that we have learned in recent years is that a court which ventures too far beyond what the educational process has prepared the public to accept will inescapably lose the broad support upon which its legitimacy ultimately depends; the same is true for a legislative body. And that is why your bill is so important, Mr. Chairman.

Our environmental problems have only reached broad public consciousness within the past two years. Prior to that, we had lived with a mythology that expressed man's domination of nature. We were taught in our schools that man could conquer nature; even our art reflects that mythology. It is interesting, parenthetically, to contract our painting with that of the oriental artist who sees man as an extension of nature and who depicts him as a tiny figure against a backdrop of huge mountain ranges and vast seas. If we are to survive, we can no longer afford the luxury of our myths.

The environmental issue is now popular. Vast numbers of bills have been introduced seeking to curb one or another form of industrial pollution. I am concerned, however, that like the civil rights movement, the fad will be over shortly and another issue will take its place. Again, like the civil rights movement, this issue will not disappear; the stakes will simply be higher and the problem more difficult to resolve. Accordingly, Mr. Chairman, I think your approach it critical.

We must begin a massive and sustained education program right now. We must build a constituency for the future, a constituency that will not permit the issue to fade away; that will expect government and industry to clean up the air, to purify the water, and to provide a livable urban environment—and we have to begin in the public schools. We cannot afford to produce judges twenty years from now who view pollution as an inevitable consequence of a complex industrial society and thus fail to impose meaningful sanctions upon those who destroy the environment. More important, we can no longer afford those persons in positions of industrial responsibility who do not share these views. Industry right now has the technology to substantially reduce vehicular pollution; that it is not compelled to do so is a failure of education. We have been educated, especially in the cities, to accept a certain amount of pollution, a certain amount of litter, of noxious odors, of choking traffic—the list is endless.

A concrete illustration is the asbestos problem. There is compelling evidence that the spraying of asbestos and the release of asbestos into the ambient air creates a serious public health hazard; at the very least those persons in close proximity to such spraying are in serious jeopardy of contracting lung cancer. The causal relationship between spraying asbestos and lung cancer is greater than that which has been established between smoking cigarettes and lung cancer. We have just promulgated the most stringent regulations in the country with respect to this problem. They will take effect on Monday, April 13. We intend to do more immediately after holding a public hearing within the next month. Had the public been educated to this problem sooner, I am certain that many lives would have been saved. It takes no education to accept the simple proposition that assault and battery is an antisocial act deserving of criminal sanction. We know without much education, that a punch in the nose hurts. It does take some education, however, to understand that asbestos particulate is far more injurious than a punch in the nose, and that such activity is far more anti-social, whatever the economic gain.

In the past few months, I have listened to many arguments in behalf of industry, arguments which center around the cost of pollution abatement. Perhaps my approach is too simplistic, but I remain unimpressed by such arguments. A burglar would not be heard to argue that the cost to him of refraining from his anti-social activities would be too great to bear and thus he should be permitted to carry out his trade, albeit perhaps, on a more restricted level. Again, the causal relationship between burglary and loss of property is quite clear. As I have become educated, and I am by no means an expert—they did not have environmental courses when I went to law school—the causal relationship between pollution and public health in specific areas has become as clear as my burglary analogy. Accordingly, the Environmental Protection Administration will take this very simple approach: others must balance the competing economic interests, the function of the Environmental Protection Administration is to protect the environment—nothing else.

When the public becomes educated through your bill, Mr. Chairman, through a series of public hearings which the Environmental Protection Administration intends to conduct over the next few months, through the media, I believe that this approach to environmental problems will be vindicated.

Because I am persuaded that the problem is too urgent to await the impact of future generations which will be more educated to it, I am particularly heartened by the provisions in your bill which contemplate adult and industrial education. If I seemed too harsh with respect to the industrial pollution, it is not because I subscribe to an environmental devil theory, but rather because I feel that the absence of environmental education has foreclosed large segments of industry, until very recently, from giving the problem serious attention. Having permitted the problem to become as serious as it is, industry is now on the defensive. The tunnel vision which sees the short-run profit and is blind to the long-run disaster must be overcome. Hopefully, education will broaden such a vision, all of us need it.

I have, Mr. Chairman, just some final observations. Your bill speaks in terms of environment and ecology. I have used the word environment in my talk. Ecology is generally associated with the balance of nature, focusing upon our rivers, forests, natural resources and the like. When I think of the environmental problems of the city, I think of rats, roaches, garbage, blighted housing, neon lights, everything that fouls the city. I hope that the educational programs implemented under your bill will address themselves to those issues as well as to the ecological problems. The two problems are, of course, ultimately inseparable. But in the short run at least we must find environmental solutions for the city. We must find ways to sustain our own peculiar ecological balance, to dispose of the staggering amounts of solid waste, to retrieve our abandoned cars, to reduce the choking traffic, to clean up the city's air. In short, we must strike an ecological balance between man and man, as well as between man and nature.

One final thought, and that is the establishment of a federally funded environmental college. I am not fully familiar with the literature in the field, and so my idea may not be a new one. In any event, I believe that the city needs a systems approach to these problems. Every relevant discipline must be involved. Environmental effects of a particular technology are far-reaching, having political, social, economic and legal consequences. In order to understand these problems, I believe that such a college, having available under one roof all of these related disciplines would be invaluable. I recommend it to you for your consideration.

Thank you very much for giving me the opportunity to testify before your committee.

Mr. BRADEMAS. Thank you very much. I think your statement is a first-class one.

One reason I think it is, is I think you are the first witness we have had perhaps before our subcommittee who made a point that was very much in my own mind as we worked in putting this legislation together, namely that it was essential, if we were going to be effective in attacking the problem of pollution and protecting the quality of the environment, to be able to generate public support for measures, both private and public, and that, unless we had a citizenry literate in these matters, we were never really going to be able over the long haul to get much done for the reasons you point out in such excellent fashion on page 3 of your statement where you note that too many citizens, even in positions of important responsibility, simply assume that pollution is part of what an industrial society has to live with.

So I appreciate that analysis.

I might also say finally that with respect to your suggestion of a federally funded environmental college, you may be interested to know that a report was published a few weeks ago for the President that required the President's Advisory Council recommending environmental colleges at 20 of the universities and colleges in the United States.

We heard a few weeks ago from the coauthor of that report. So that may be in the direction to which you referred.

I have no other questions other than to thank you for your excellent statement.

Mr. Reid?

Mr. Reid. Thank you very much, Mr. Fabricant, for your thoughtful testimony and I wish to express our appreciation to Jerry Kretchmer as well, who couldn't be with us.

Let me ask you this question. From the standpoint of the law—and I gather you are somewhat concerned as general counsel in this area—do you feel that you begin to have the needs to deal with a Con Ed which does not have stringent standards on the ecology and may not even have very stringent thoughts about thermal pollution or radiation dangers?

And, do you have any suggestions as to what could be done in this area that would be helpful to you from the standpoint of the term you used a minute ago, municipal colleges?

Mr. Fabricant. Yes, the present fine structures are entirely inadequate when imposed, and that is part of your bill.

The judges themselves don't view the problem in the way they ought to, simply because I think they are not educated in the problem.

What we ought to be thinking about is an environmental court which would deal with the problem administratively and impose realistic fines.

It is quite easy for a large industrial corporation to accept a $25 fine over and over again and continue to pollute and accept that as a cost of production.

Mr. Reid. What about a hundred thousand dollars a day?

Mr. Fabricant. I would be in favor of an injunctive remedy, where a willful and continuous violator would have his doors padlocked period, until he had his standards in conformity with the requirements of the municipal authority.

That's the actual remedy, I think.

Mr. Reid. You feel there is no large fine that would be meaningful to the large polluter?

Mr. Fabricant. Of course I do. But I think there would be reluctance on the part of most of the judiciary to impose such a fine.

And in conjunction with a fine system that would be more realistic I think the injunctive approach, I think those two would be more realistic.

Mr. Brademas. Thank you.

The Chair wants to thank the witnesses who have appeared before the subcommittee this morning. Their testimony has been most valuable.

The subcommittee is adjourned.

(Whereupon, at 12:20 p.m., the subcommittee adjourned.)

ENVIRONMENTAL QUALITY EDUCATION ACT

WEDNESDAY, APRIL 15, 1970

House of Representatives,
Select Subcommittee on Education of the
Committee on Education and Labor,
Washington, D.C.

The subcommittee met at 10 a.m., pursuant to recess, in room 2175, Rayburn House Office Building, Hon. John Brademas (chairman of the subcommittee) presiding.

Present: Representatives Brademas, Bell, and Hansen.

Staff members present: Jack G. Duncan, counsel; Marty LaVor, minority legislative coordinator; Ronald L. Katz, assistant staff director, Maureen Orth, consultant; Arlene Horowitz, staff assistant; Toni Immerman, clerk.

Mr. Brademas. The subcommittee will come to order for further consideration of H.R. 14753, the Environmental Quality Education Act.

The first witness this morning is John W. Macy, Jr., president of the Corporation for Public Broadcasting Co., former chairman of the Civil Service Commission. I am very pleased to welcome Mr. Macy here today and look forward to your testimony.

STATEMENT OF JOHN W. MACY, JR., PRESIDENT, CORPORATION FOR PUBLIC BROADCASTING

Mr. Macy. Thank you very much, Mr. Chairman. I am honored to have the opportunity to testify before you in the company of so many others who are interested in this legislation.

I would like to commend you for your landmark efforts in an area with tremendous implications for the future of human life. I commend you not merely for your proposal as it stands—an act of wisdom and promise—but also for the sounding board these hearings provided for the various spokesmen of our national effort to improve the quality of human environment.

I am pleased to be able to add my support to that of those who consider the objectives of H.R. 14753—the Envorinmental Quality Education Act—as among the most vital imperatives of today.

The doomsday soothsaying has done its work. It has jolted us into awareness that we are lockstitched into the deteriorating fabric of life and there is nowhere to go but here.

Lest this awakening jar us past useful action and knock us into a state of frozen apathy, it is time now to turn our attention and energy to building—building in new directions on new information. One of the most important of these directions is toward new attitudes, new awareness of what constitutes a satisfactory human condition.

There is much that can and must be done immediately if we are to survive long enough to make environmental education a factor for the future. But in the thoroughly justified haste to do what must be done immediately, we cannot neglect the longer range tasks—those that must be undertaken at once if they are to bear fruit in time to keep the whole crisis from happening again—and again.

It is my wish, Mr. Chairman, in appearing before you today to emphasize what I consider to be the most helpful direction implicit in your bill—that of innovation. It is obvious that the old methods have failed. Conservation education has tried manfully to do the job, but the ecological state of the Nation belies the effectiveness of measures that were, for the most part, resource-oriented.

If I read your proposal correctly, you are not recommending that we simply keep on doing more of what we have been doing. As I understand your proposal, it is aimed at finding new ways of bringing the environment (what is around us), ecology (the way it all works) and man (who is the most disruptive factor in the ecologic/environmental picture) into personal, working focus.

In other words, this bill would foster new approaches to making ecology a part of every individual's awareness patterns. As a long-range goal, only this kind of altered human outlook will do.

I am very much interested in the ways that public broadcasting can interact with your educational efforts to improve the quality of the environment.

The aims of this bill conform to the concerns expressed in a resolution passed by the National Association of Educational Broadcasters at their meeting of last November. This group represented all facets of the public broadcasting community, including station managers, educators, and program specialists. This resolution read—

> We are concerned primarily with the need for greater public awareness and commitment to resolving the important issues concerned with the natural environment and with the man-made conditions which jeopardize it.

Mr. Chairman, I offer for insertion in the record the full text of this NAEB resolution, as it demonstrates the awareness and commitment of public broadcasting, from station level on up, to working for the environmental cause.

(The resolution follows:)

Resolution of the NAEB Executive Board, November 1969

Resolved, by the Executive Board of Directors of NAEB, that its staff and membership are asked to identify specific ways and means by which radio and television can be used to deal with matters of major national priority. We are concerned primarily with the need for greater public awareness and commitment to resolving important issues concerned with the natural environment and with the man-made conditions that jeopardize it. And we are concerned as well with the critical deficiencies in education and the inadequacy of traditional means for dealing with them efficiently.

In the matter of ecology we must find ways to communicate the critical nature of the problems this society faces as we disturb traditional balances in the biological and physical nature of life on the earth; and we must encourage the means by which these changes can be accommodated or prevented. Substantial public understanding and constructive action only come as a consequence of

> sustained communication efforts implemented at every level and in every sector of our public and private activities.
>
> In the matter of education, we firmly believe that the benefits which radio and television communication technology can bring to basic and fundamental educational requirements have yet to be demonstrated on a full and comprehensive basis. We request the staff to prepare recommendations for Association actions in these areas; we request the Task Force on Educational Broadcasting and Public Responsibility to include recommendations on these matters in its report; and we urge the membership to develop proposals for activities that will result in local efforts in these two critical areas. We urge our members and we commit ourselves to undertake plans that will result in such demonstrations, testing through actual operating circumstances the thesis that communication technology can help us accomplish more for less.

Let me review briefly the purposes of your bill, certainly not to refresh your memory, but to make clearer the optimistic assessment I have made of the role that I feel public broadcasting can play.

Your bill proposes to develop our understanding and hone our awareness of the environmental and ecological situation; to disseminate new materials and information for use throughout the Nation; to provide for community education programs that bring adults into the environmental action picture on the plus side of the scales.

These are broad and worthy purposes. What we are talking about is what Commissioner Allen refers to as EEE—environmental/ecological education. Some have referred to it as EQ, but I would prefer it EEE, instead.

The specific tasks involved can be summed up briefly by saying that we must (1) build an awareness of how we and our technology affect and are affected by our environment; (2) instill a concern for man's responsibility to reestablish balanced relationships among all forms of life within the closed earth system; and (3) develop the motivation and training that will enable us to acquire and spread the knowledge and skills that will help solve our environmental problems and prevent their recurrence.

In short, no matter from which angle of environmental abuse we attack it, our central problem is to create a citizenry with a clear understanding that man is an inseparable part of the ecologic system and that our continued existence is directly tied to that system's continued functioning.

This is an enormous mission. It is precisely the type of mission for which public broadcasting is uniquely suited.

The broad scope of educational effort we are talking about must take place at every level of the educational enterprise. Public television is geared to such an effort. We are peculiarly organized to reach the public with programs of a general nature, and to zero in on target audiences with specifics to catch and hold almost any particular interest sector.

There is opportunity to reach everyone on public broadcasting, from toddlers to senior citizens, and in addition, we have proven—with such singular successes as "Sesame Street" and "Mister Rogers' Neighborhood," that we cannot only reach—but teach target audiences. This is an area that conservation education has largely left untouched. And yet surely, if we are to effect a changed outlook—to create anything approaching a national environmental ethic—then this is just the direction we must take.

We are deeply involved in education from the preschool level in the home, to classroom teaching in elementary, secondary and higher education institutions, to continuing education in the community at large. We reach people in all geographic areas and at every economic level. A recent survey taken by the Louis Harris organization indicates that about 24 million people watch public television each week. In addition, recent findings show that nearly 6 million children watch "Sesame Street" each day.

Because of its public service objectives, the Corporation for Public Broadcasting has a strong commitment to giving the citizen a direct role in the programing and related activities of public broadcasting.

In June 1969, the Corporation formed an Advisory Committee of National Organizations to advise the Corporation on present and potential programing, with special emphasis on determining subject priorities and opportunities for direct citizen participation in public affairs programing. The advisory committee now has 26 member organizations who meet regularly with me and the Corporation staff to evaluate specific programing ideas.

I was interested to see, Mr. Chairman, that quite a number of your witnesses before this committee come from this very group. Over half of these organizations have indicated that they are already committed to use staff and financial resources in efforts aimed at the preservation and improvement of the environment. This creates a potential for developing a blend of environmental education programing and participation activities which would involve the millions of Americans active in the State and local units of these organizations in a wide variety of roles.

The Corporation is committed to providing opportunities for the citizen to become an active, effective participant in the development of public broadcasting, and especially in producing programs on such vital issues as environmental improvement. The possibility of involvement under the Environmental Quality Education Act would advance this commitment through the extraordinary opportunity to explore the almost limitless potential of broadcast programs concerning environmental problems.

Another highly complementary function of public broadcasting in the overall environmental education effort is its ability to produce programs about the environment on a continuing, rather than on a crisis-to-crisis basis. As we envision it now, we would investigate first, on the very broad level, and then focus on various aspects as they relate to air, water and land.

We would plan to show the situation as it exists today—urban and rural, east and west, affluent and deprived. We would attempt to discover how it got that way, and we would explore options for change—alternative futures, if you will. These would include that of letting the deterioration continue on its present course.

These are the types of programs, generally speaking, that we feel would serve to further the three goals of EEE.

We have noted that many witnesses before this subcommittee have stressed the importance of developing an interdisciplinary curriculum for environmental education. This is an approach which the public broadcasting community recognizes as essential if people are to be made truly aware of the interrelatedness of the ecological system. It is an approach we are already building into our programing.

Public television's coverage of Earth Day, April 22, is an example of what I mean. The Corporation for Public Broadcasting has provided National Educational Television ith funds for its all-day broadcast devoted to Earth Day. Both live coverage and regular programs will focus on questions about the environment and the forces that threaten man and his environment.

NET's Earth Day plans are an excellent study in the flexibility of public broadcasting and its ability to handle "interrelatedness," not just as a subject matter but as a way of presenting a subject. NET will begin the day with live coverage of activities in the East. Participants will range from Senator Muskie and Ralph Nadar, to the cast of "Hair," which will be seen performing from a moving garbage truck. Viewers will move with us from the Declaration of Independence in Philadelphia to the Washington rally on the Mall, then to New York for a citizen march down Fifth Avenue and a scrubdown of 14th Street.

From 4 to 6 p.m., Earth Day will tie in with regular programing for children. "Sesame Street," "Mister Rogers' Neighborhood," and "What's New?' will all deal with ecological themes, demonstrating how the subject matter can take on the flavor of its audiences interests and capabilities.

I won't lengthen this testimony by recounting with you the remainder of our Earth Day coverage plans, but I urge you to be with us as much as possible throughout that day. If you join us, you will see special plays, live coverage of the San Joaquin Valley survival walk, a special edition of "Book Beat" focusing on "Since Silent Spring," among other features.

"IMPLICIT CURRICULUM" ON PTV

There remains one very important contribution that public broadcasting is peculiarly equipped to make in the field of environmental education. Educators have labeled as "implicit curriculum" that whole system of values that the child picks up outside of school—values that spring from a world of hard rock music, drama, dance, and film—things that really grab youngsters—things they feel they are expected to leave at the school door when they enter, and which are waiting there to claim their attention and commitment as they leave. Too often these values are completed at odds with what they are asked to accept in the classroom, so they simply turn off and tune out while they are in school.

This other world of values is sometimes referred to as countereducation. In public broadcasting, we do not think this state of affairs need continue to be so. We are planning to use these same media—dance, drama, films, and hard rock music—as classroom purveyors of the environmental condition. We intend to surprise the students by adopting their language and telling them that school isn't an intellectual desert, unrelated to their lives; school can be where it's at. Bring the environment home to the youngster first; the grammar can come later.

Our approach then has been to start immediate, active exploration of the broadcasting opportunities inherent in the emerging EEE goals of the Office of Education, developing programing for teacher training, manpower education, public affairs, and cultural programs—all in the furtherance of environmental quality.

We heartily support H.R. 14753 and we intend to continue our own efforts along the comprehensive lines set forth in our bill as we understand them.

Again, I thank you for allowing me to speak to this important question. I want to thank you for this trailblazing opportunity.

I will be glad to answer any question you may have.

Mr. **Brademas.** Thank you, Mr. Macy, for your valuable statement.

I have several questions to put to you. First, you will recall that in the bill we specifically authorized grants for preparation and distribution of materials suitable for use by mass media in dealing with the environment and ecology, in large measure because we are aware of the kinds of contributions for the Corporation for Public Broadcasting and educational television have generally already indicated they can make in helping educate the public in a wide variety of important areas.

Therefore, I wonder if you could tell us what kinds of institutional arrangements would be helpful for pursuing environmental education through using the media.

Mr. **Macy.** First, Mr. Chairman, let me say that I feel the language in section 3(a)(5) of the bill does provide the necessary authority to involve the corporation and public broadcasting in environmental education.

Secondly, the institution approach which we have been pursuing has been modeled somewhat after our success story, "The Children's Television Workshop."

We are in the process of developing a model organization which would conduct the necessary research and testing and then supervise the development of broadcasting programs, not only in television but in radio as well.

I believe radio is an area which is so ubiquitous that we frequently overlook its potential.

Just to digress for a moment, I think the coverage of the difficulties in the flight of Apollo 13 have evidenced once again the effectiveness of radio in bringing to the public an immediate and comprehensive understanding. It is simply a more effective medium.

So it would be our expectation, assuming available resources from both public and private sources, that we would move in the direction of establishing such an institution which would have as its fundamental goals the development of broadcasting of a general nature for a national audience, supplemented by local broadcasting oriented directly to environmental problems in a specific community.

I make this latter point because I have the conviction that citizen participation and involvement in programs of correction must be locally based and locally motivated. I believe each community is different and its set of problems are effected by the total environment of that community.

Because public broadcasting puts such a heavy emphasis and such an affirmative reflection on the local station, it would be our belief that we should endeavor to support local activities designed to meet the needs in the communities.

The second area of purpose would be to provide broadcasting curriculum materials in the ecological area, built on an expertise linear base.

We haven't gone far enough to say yet what the school age group would be, and I don't think it is too important that we try to localize this at an age level or bracket.

Accompanying that program, obviously, there will be need for teacher training. We don't believe a great deal has been done yet in the use of the media for teacher training. We would hope that we could utilize the urgency in this field to embark upon some constructive work in the field for teacher training.

The third area or purpose would be manpower training. We share the conviction of many others that if we are truly to launch an attack on the improvement of the environment, it will necessitate new skills and the creation of new jobs which have not existed previously. Here, too, the media can be effective in the teaching of those skills, in the understanding and awareness of those jobs.

So this is the scope that we have in mind. It would be our objective to have such an enterprise financed jointly by public and private funds, just as the children's television workshop is funded by the Federal Government through the Office of Education and by private entities, the Ford Foundation, the Carnegie Corporation and our own corporation.

Mr. **Brademas.** I noted that on page 7 of your statement you referred to what you described as "Implicit Curriculum," which makes an impact on the learning of children. I wonder, having used that phrase, if you could tell us, first, if you do anything in the "Sesame Street" series in order to make a dent in the consciousness of the preschool youngsters about the environmental problem; and, second, related to that question, I note that on page 8 of your statement you say that in public broadcasting you are plannning to use the media as "classroom purveyors of the environmental condition."

You say you are "planning." I wonder if there is anything you want to elaborate on that? In other words, I am trying to get at the extent to which you are already in the business of taking advantage of the implicit curriculum.

Mr. **Macy.** We believe we are already pursuing this, and in many ways this is reflected in "Sesame Street." "Sesame Street" beamed into the home is also, interestingly enough, being used in the classroom. It is a program which is based on very comprehensive and penetrating research to explore the existing idiom that attracts and holds the attention of young children.

So there is animation and there is fast music and there is a quick treatment of subjects.

We feel that this has already demonstrated a learning value in that the pre-school children who are watching this program in measurable terms with respect to learning numbers and letters have advanced at a much more rapid rate than those pre-schoolers who are not exposed to those programs.

With respect to the environment, as I indicated in my statement, on "Earth Day," there will be a special treatment of the environment, not only in "Sesame Street," but in other children's programing as well. And the program people at the children's television workshop which produces "Sesame Street" feel that in many ways what they are doing every day is by way of environmental education, because they are endeavoring to create an awareness and a sense of values for the youngsters observing those programs in terms of the world around them, so that he doesn't grow up in isolation and that poverty is not his lifetime lot.

As far as injecting some of the implicit curriculum into classroom programing, that is already occurring in some of the programs that are developed for delivery by public broadcasting stations into the classroom. Where that is done, it has to be done in conjunction with the local school systems, because we have 22,000 in this country. There isn't a great deal of uniformity, and it depends a great deal on the attitude of the existing school system, upon the system and curriculum creators and the teachers themselves, as to how much of this can be done.

I feel this is very important. That in this environmental educational effort that those in education be brought along with it; that they see the opportunity to really provide some new meaning and I think some new color to teaching by relating it to the environmental situation.

I feel that in the institution I have described, we would try to find and try to create a home for creative educators, as well as others who can use the media creatively.

Mr. **Brademas**. I appreciate that, and I was especially glad, Mr. Macy, to see you tie in, and again in your statement talk about the need for new attitudes, the need for new materials and the need for new methods of teaching innovation. I think you have caught the central purpose of this bill.

I have just one other question to put to you and then turn you over to Mr. Hansen.

You say on page 5 of your statement that the Corporation for Public Broadcasting is committed to providing opportunities for the citizen to become an active, effective participant in the development of public broadcasting and especially in producing programs on such vital issues as environmental improvement.

Can you tell us more concretely what you mean by that objective?

Mr. **Macy**. Yes, sir. Our belief is that since we are a public broadcasting corporation, and since we are endeavoring to provide a public service, that it is important that we learn as fully and effectively as we can what the needs and desires of the American people are in terms of the media.

As I have cited, initially we have formed an advisory committee of national organizations. We are urging the individual stations to create local advisory committees.

We are also eager to find new formats whereby the citizen can actually participate in the programs. An example of our experimentation along this line was what we endeavored to do at the time of the White House Hunger Conference in December. With limited funds, we worked with 12 of the stations for their development of local town meetings to discuss the problems of food and health and nutrition.

Out of those 12 meetings came a series of actions in many of the communities where they were held, as well as a video record of public attitudes on many of these issues.

We are hopeful on such vital issues as environment and hunger and population, and other issues that are so central to our society today and for the future, that there can be a greater degree of involvement by citizens themselves in the treatment of those issues by the public media.

Mr. **Brademas.** I thank you very much.

Mr. Hansen?

Mr. **Hansen.** Thank you, Mr. Chairman. Let me extend a warm welcome to you, Mr. Macy, and express my appreciation for your testimony. You may be interested to know that after I came to my office this morning, my wife, having read the witness list in the newspaper, telephoned me to call to my attention the fact that you were going to be here. She was impressed with your background, and told me many of your accomplishments. I am also impressed.

Mr. **Macy.** Thank you, sir; thanks to her.

Mr. **Hansen.** I am very excited, in listening to your testimony, over the possibility of utilizing educational television as one of the most potent instruments in reaching the public consciousness and in providing the information that must be the basis for the shaping of attitudes toward the environment.

So I commend you for the very constructive set of goals that you have outlined in your testimony.

Most of the questions I had, the chairman has covered, but I have maybe one or two you could elaborate on.

In attempting to achieve the objectives that you have outlined in your testimony, can you list some specific contributions that this bill will make if it is passed and implemented?

Mr. **Macy.** I feel that this bill is important in establishing a congressionally supported statement of national policy on the desirability of developing in our educational system means for disseminating the better understanding and higher awareness of the environmental problems that we face.

I believe that this kind of affirmative statement would go a long way to guide the executive action in bringing this about. I would feel that from the rather unusual perch that we have, as an organization not of the Government, and really not of the private sector, that it would be exceedingly helpful to have this congressional intent as clearly as forcibly expressed as it is in this legislation.

Mr. **Hansen.** On the question of programs, such as "Sesame Street," and I know you have covered this somewhat in response to the chairman's question, what environmental component do you anticipate incorporating into programs aimed primarily at the preschool child?

I might say that a number of witnesses who have testified in these hearings have emphasized the importance of educational efforts as early as possible in the life of the child.

So I think, the rather remarkable results that we have seen from Sesame Street, suggests that more attention might be given to these very young children in helping to develop the kinds of attitude toward the world they live in.

Mr. **Macy.** That is very true. Some recent research has evidenced that a large part of the learning experience now occurs before the child goes to school. So the preschool experience is tremendously important in determining the youngster's future capability, and since the preschool child, regardless of his economic background, is now watching television 30 to 50 hours a week, that becomes his window on the world, that becomes his exposure to the environment.

As far as the components of presentation are concerned, the experience in Sesame Street, is that it is desirable to give the youngster knowledge of the elements in the world around him. These programs are particularly intended for the child of a disadvantaged background.

The research has shown that the youngsters in the ghetto or the rural poor live a kind of environmental isolation, and they don't appreciate the elements that constitute their world. So that this is a means of using that window on the world to show them what exists.

I recall that in the very first program there was a very good, fast-moving treatment of milk and where the milk came from and the importance of it in a diet. There have been little episodes about the importance of avoiding litter, and the aspects of trash collection. There has been by subtle and educational approaches reference to air and water pollution and the need for purity.

All of this was done with also an eye for entertainment. This has been the great achievement; this has been a combination of education and learning.

So I would hope that our programing wouldn't be so self-conscious in its attack on environmental problems that it would cause the youngster to turn it off, and I don't feel it has to be that way. That is why I took the time I did in my statement to indicate that we want to use drama; we want to use music; we want to use all of the aspects of our culture that can serve to point this up.

I recall last summer when we had a series of Sunday evening programs on public broadcasting called "Sounds of Summer." One of them clearly was an ecological demonstration because it was music delivered by Pete Seeger and his crew as part of an effort to clean up the Hudson River.

I think in many ways we can utilize sort of a multimedia approach to deliver the message on environment, and I would hope the creative people in education and the media would be able to come up with new and effective ideas.

Mr. HANSEN. To what extent may we expect some of the leadership that you have been furnishing in this area, some of the results of your pioneering efforts to be followed by commercial television? Can the objectives you have outlined be accomplished by commercial television?

Mr. MACY. Yes, I think already we are seeing the impact of "Sesame Street" on children's programing on the commercial networks. I pointed out yesterday in my appearance before the Commerce Subcommittee on Communications that all three networks have hired new vice presidents for children's programing since "Sesame Street" went on the air in November.

Chairman Burch of the FCC said he looked at the public broadcasting as setting a kind of standard for broadcasters that in many ways would be a more effective means for improving commercial programing than increased regulation.

Let me add, lest I be misunderstood, the commercial broadcasters have been very supportive of everything that we have been doing in public broadcasting.

Washington is full of fight promoters and people are trying to promote a fight between commercial and public broadcasting. It just doesn't exist. In fact, a great deal of our support has come from private networks, and I expect we would find ways of working with them in this whole environmental area.

Mr. HANSEN. Yes, I am aware of the support that has come from private television. From what you tell us here, apparently any real success that we can demonstrate in educational television would be multiplied in terms of its total impact because of the likelihood that it may be picked up and incorporated in the content of the commercial television programing.

Mr. MACY. I feel that it will. I think this is an optimistic note, and I think in our society, where there is a variety of competing means for delivery, that this competition will be healthy in delivering a valued product to the viewer and the listener.

Mr. HANSEN. Thank you very much for your statement.

Mr. BRADEMAS. Mr. Macy, thank you very much, indeed, and we shall try to tune in as soon as possible on some of the programs you will be doing across the country next week.

Mr. MACY. Thank you again for your leadership in this field.

Mr. BRADEMAS. Our next witness is Mr. Peter S. Hunt. Mr. Hunt, we are glad to have you with us. Please proceed, sir.

STATEMENT OF PETER S. HUNT, PETER HUNT ASSOCIATES, CONSULTING FIRM, BRONXVILLE, N.Y.

Mr. HUNT. Thank you, Mr. Chairman and members of the subcommittee.

My name is Peter Hunt, and I run a small consulting firm that was formed some 3 years ago to focus on the problems of our physical environment. My personal background includes management consulting in the fields of systems analysis, planning programing and budgeting, cost benefit analysis and some 6 years of marketing and finance in one of the country's largest corporations. I hold an MBA from Columbia and an undergraduate degree in the biological sciences.

Since my experience in education is limited to the role of student, I would like to focus the majority of my comments on the proposed managerial concepts and structure of this bill. In essence, the composition, dimensions, and operating procedures of the organization is expected to bring the purposes of this legislation to reality. Although it may sound self-serving, I am convinced that an inappropriately designed organization would needlessly frustrate the attainment of the bill's goals. In short, it would take longer and cost more than necessary to do the job.

However, before addressing these subjects, I would like to register my complete and enthusiastic endorsement of the legislation's underlying concept. That our survival as a species is threatened because of our insensitive behavior toward our environment is not subject to serious question. To control this situation before it becomes a terminal condition will, I am convinced, require some fundamental changes in our individual behavior. It is unrealistic to expect that these necessary behavioral changes can be effected by legislative action without first convincing the public of the consequences of doing nothing. In effect, you must through education build a constituency which will accept, if not demand, what would be currently viewed as unwarranted and disruptive Federal intervention.

This bill responsibily serves the governmental function in cultivating a public awareness of the consequences of continued deterioration of our world's environment quality.

In addressing specific aspects of the bill, I feel first the scope of the policy section is too restrictive. The problems of the environment, and hence their understanding, is not limited by national boundaries. What we do to the Great Lakes influences Canada; the destruction of national estuaries influences international fisheries; foreign atomic testing may impact our personal health. I thus recommend that the scope of the policy section be expanded to include international, as well as purely national considerations of the environment.

By doing so, you would permit international exchanges of curriculum, faculty, technical data, processes, and cooperative programs. It is my understanding that Sweden has already initiated an adult education program on environmental problems that might be useful in the development of our domestic efforts.

If I may depart from my statement at this time, Mr. Frank Potter and I have been in contact with Mr. Olander at the Swedish Embassy and hope to have an opportunity to review their program this summer.

I would now like to direct my comments to the mechanisms and proposed structure for implementing the intent of this bill. The problems we are attempting to correct are extremely sensitive to time. The costs of any specified result tend to increase exponentially over time and indeed may pass a point of no return where correction becomes impossible. We cannot bring back the passenger pigeon. It is extinct. We should not attempt to bring back Lake Erie since we could buy so much more with the required resources if we spent them on other lakes and rivers.

In light of this high sensitivity to the passage of time, the managing organization of this program should be designed for rapid aggressive decisionmaking. True, the probability of making mistakes with a fast-acting group is higher than with the slower moving traditional structures. But it is my intuitive feeling that the cost of these inevitable errors will be more than offset by the social and economic costs that will attend the deferred decisions of a slow and deliberate organization.

THE ADVISORY COMMITTEE

An advisory committee of 21 members is far too large to handle the duties of managing this program. To be effective within a workable time frame, policy decisions and grant approvals are going to have to be made on a day-to-day basis, without waiting for the approval of a chairman and 20 part-time peers.

In line with this, I recommend that all duties of the advisory committee be placed in a full-time team of three program directors. That in the selection of these directors, no preference be given to people with either scientific or educational backgrounds, but that the qualification be those of a general executive who has a personal conviction as to the importance of the job.

Further, that these directors be appointed for statutory, rotating 3-year terms.

In addition, I suggest that the size of the advisory committee be reduced to 10 people from a mix of unrelated fields and their functions be limited to reviewing performance of the program and advising the directors on a quarterly basis. At least four of these committee advisers should be under 35 years old.

LOCATION AND MANAGERIAL LEVEL

The location and managerial level of the operating organization also seems inappropriate to the job. As outlined in the bill, they would be submerged well down in the bowels of the bureaucracy under the advisory committee, the Commissioner of Education, the Secretary of HEW, the President, and remote from the Congress.

Concomitant with this subordinate level comes an increasingly larger burden of dampening paperwork justified by their multiple superiors, as a method of keeping the juniors under control. These checks and counterchecks of paperwork, in effect, are likely to put the operating group out of action by increasing their response time to requests for aid and frustrating applicants. The inevitable result of a drop in applications for grants would be to either step down the program for an apparent lack of interest, or internalize the actual educational work within the group which was designed to manage and promote the program.

To avoid these problems of internalization or paperwork kill, I suggest that the operation be taken out of the Office of Education and placed at a level of higher congressional visibility. Specifically, in the Office of the President allied to the new Council on Environmental Quality.

Further, I suggest that a report of its annual activities be appended to the environmental quality report required in title II of Public Law 91–190. This shift would, I believe, help increase the prominence of the organization and reinforce the seriousness of the problem with both the President and the Congress. It also occurs to me that the Council on Environmental Quality was instructed to utilize an interdisciplinary approach. How better to coordinate with the educational aspects than by having a responsible organization as a cohort.

My next point concerns the strategy of emphasis for the various audiences outlined in the bill. To me, the most critical group or educational segment is the general public, specifically the adult population that is currently outside the formal channels of education. To reach them is of prime importance. First because their attitudes and decisions will dominate for the next 15 to 20 critical years. Second, because without their support curriculum changes in the kindergarten-through-12 education system are impossible. You may be able to develop the best educational program possible, but it will not be installed at the local level unless the adult population themselves realize the need for such changes.

I recognize that this adult group is the most difficult group to reach, and are the most resistant to change. But this, coupled with their pivotal position, just makes it doubly important that they receive the dominant focus of effort during the first 5 years of the program. If this public educational program can be successfully mounted not only will there be spill-over benefits to the other segments of business leaders, Government employees and so on, but these other groups will find, in the rising level of public knowledge and sensitivity, inducement to educate themselves.

Simultaneously, with the initiation of a public education program, I suggest that work be started on a curriculum change program for kindergarten through 12. The design, development, test and evaluation of such a program will, I am informed, take a minimum of 5 years before it is ready to come out of the lab for dissemination. With this development being paralleled by a public education program, one would hope that the State and local school boards would be prepared to accept it when it is ready for implementation, some 5 years hence.

In conclusion, I would like to thank the subcommittee for both introducing this extremely important legislation and permitting me the opportunity of appearing before you. I would be happy to answer any question on either this statement or on either of my two previously submitted comments to this bill.

Mr. Brademas. Thank you very much, Mr. Hunt. That is a most valuable and concrete discussion of some of the principal issues represented by this legislation.

I have several questions to put to you. One, with respect to your suggestion that there be three program directors, to put a hypothetical devil's advocate-type question to you—why would it be better to have three than one?

Mr. Hunt. Perhaps one with associate directors. I think it is going to take an executive team, at least, to run this properly. You have on a subordinate level the effort of the adult population, and then you have the second effort of curriculum change model development.

Mr. Brademas. There is another point you make with which I have a little difficulty. On page 4 of your statement you suggest, in terms of priorities in the bill, you would give more attention at the outset to throughout the school system.

Yet, we have had other witnesses who have taken just the reverse position, and I suppose what we would try to do, in putting the bill together, is make an effort to do both, for it seems to me difficult to put all of your eggs into one basket. When you say without the support of the adult community, curriculum changes in the kindergarten through 12 education system are impossible, I am not sure that that is the case.

I suppose one might say if you have the strong opposition of the adult community, you would have trouble, but don't you believe it would be accurate to say that polls were taken around the country to determine whether or not adults would be willing to support "Sesame Street" or "Headstart," or a wide variety of changes that have been made in the American curriculum, both in substance and in ways of teaching, if I am getting my point through?

Mr. Hunt. Well, in reference to "Sesame Street," this is just one vehicle of school education, and it is passive. In essence, it can be turned off if one wants to. Children see it voluntarily.

In the case of Headstart programs, these were directed as specific groups, not the general public and not the entire educational system.

And I think in the case of Headstart programs, these were well accepted by the audience that they were addressed to. So I see a difference here, sir.

Mr. **Brademas.** I guess all I am saying is that if one takes the position that you have got to educate the adult community before you can really move ahead in the school system in any suggested way, it seems to me to be an oversimplification of the problem. I don't know that you would really quarrel with what I am saying, but I think you have got to move ahead on both fronts.

Mr. **Hunt.** I think another thing that is important is the lag time. If you start educating in kindergarten at all, before those environment-oriented children reach a point of making decisions, you have 20 years. The lag time is there, and these are critical years.

Mr. **Brademas.** I thoroughly agree. I think I appreciate what you are saying.

May I ask you just a couple of other questions, one about the representation on the advisory counsel. You have suggested a smaller advisory counsel and that a substantial number of them be young people. What about the language of the bill that sets forth the requirement that the committee shall consist of persons familiar with education, information media, and the relationship of man as producer, consumer, and citizen to his environment and the Nation's ecology. That is fairly broad.

Mr. **Hunt.** That is fairly broad.

Mr. **Brademas.** Do you have any quarrel with that or rather that there would be no stipulation of the kind of persons to serve?

Mr. **Hunt.** Personally, I would prefer not to see a stipulation of people to serve. When you start bringing experts into groups such as this, they generally have one focus and one point of view. If you bring in a person who is experienced in education, chances are that he would have 15 or 20 years of experience in the system.

The fact that he would be the educational expert would give him perhaps undue influence in moving that advisory committee in one direction or another.

Mr. **Brademas.** Let me ask you another question. You have given us this very interesting chart in which you propose a way in which the Environmental Quality Education Act might be administratively organized, and then you have suggested a proposed operational manpower plan to staff the program.

Finally, you have given us a proposed budget.

I wonder, Mr. Hunt, if you could elaborate for us a little on your proposed budget, because as you are aware Mr. Hansen and I and the other sponsors of this bill have not written any dollar figures into the bill, partly because we wanted to hear from authorities in this field and develop some judgment as to what was needed.

Could you comment why you have taken and set forth these particular figures?

Mr. **Hunt.** Well, I started off, as you can see, through the organization chart that I worked out, with the primary areas of emphasis from the standpoint of formal education curriculum, college curriculum education and the extra special programs that I don't feel are necessary at this point: Educating community and business leaders. I feel that is an obligation they can pick up themselves.

Mr. **Brademas**. You feel that this an obligation they can carry out for themselves?

Mr. **Hunt**. Yes, I do, and I feel if the public was educated enough they would find it in their best interests.

Mr. **Brademas**. I am not as enthusiastic as you are about that. I just don't see local business and industrial leaders clamoring all over themselves to educate themselves about these matters, and I would say the same about State and local officials.

The part I was getting at in this part of the bill is to help make environmental education accessible to leaders of this kind at the community level. Otherwise how are they going to educate themselves unless they happen to turn on one of John Macy's television programs?

Mr. **Hunt**. Well, these are the spillover benefits I am talking about. If public television programs and environmental book societies are established, they would have the opportunity of joining those.

To get on with this, I have broken it down, as you can see, into a number of subordinate tasks. For the development of the curriculum, there are six areas: Urban, Northeast, Southeast, Central, Mountain, Pacific; specific curriculums would be developed for each educational system that would relate to the students and would show them how to use their local environment as a field laboratory.

On the basis of that, I went through the manpower planning schedule from the standpoint of people involved, again placing the heaviest emphasis on formal curriculum education and public education, as far as the number of professional staff members that would be involved.

Then, as you may note, it runs from 28 professionals to 32 over a 5-year period. I am quite sure that more than that might be effectively used. I am not set on those figures. I would say, if anything, they described a minimum position.

In the budgetary area, I went through and costed it out on the basis, first of the amount of dollars that executives and professionals of this nature would be expected to spend on an annual basis, including the travel expenses. As I remember, the general professional would run at about $28,000 to $32,000 a year. That is what it would cost to keep them effective. Then I added what I felt was an adequate staffing of secretaries, and so forth, to back them up.

The grants in external expenses is over 90 percent of the 5-year program.

I am very tenuous on the formal curriculum education. Dr. John Swazy and Eugene Ruth from Teachers College in New York worked out a budget for a curriculum change model, and this was used from K through 8 and 9 through 12. In total, I believe that digests about $6 million over the 5-year period each, $12 million in total.

One place I am on thin ice is this public education budget. I didn't have the opportunity of going through detailed cost analysis, as far as what it costs to mount museum shows; how many should be run; what was the cost of television program, and so forth. So, if anything, that is the weakest element, the $3, $7, $9, $12, and $15 million.

I scaled enough overtime to show I felt it should be a continuing effort, and as we learn more about environmental problems, it would require more money to educate the public as to the nature of those problems.

Mr. **Brademas**. That budget, I take it, reflects your earlier statement that you felt much more priority should be given to the public education than to the provision of courses through the school system?

Mr. **Hunt**. Correct, sir. On the other hand, as I stated in the testimony, it will take 5 years just to develop the curriculum material. In 6 or 7 years, I would see the normal curriculum education becoming far more expensive as it went into dissemination. That is when it is really going to cost the dollars. It is unfortunately out of the timespan of this 5-year budget.

Mr. **Brademas**. This is about $65 million over 5 years, if I calculate what you have come up with.

Mr. **Hunt**. Yes, sir.

Mr. **Brademas**. This is most helpful to us, and I just have one other question. How is it possible to put so much money into the public education by way of distinction with the elementary and secondary school system if you argue, in part, that you can't do more in the school system because you don't have the curricular materials.

Would you not run into that same problem so far as providing adult education programs is concerned.

Mr. **Hunt**. Well, I see the adult education programs as sort of a sequential pattern of events, at least sequential objectives. The first one is the problem of sensitizing the general public and let them know that a problem does exist.

After that comes, in essence, the educational process, following that attitudinal changes, and after that some changes in the behavior.

But television is a very efficient medium in that respect. Programs can be run over and over in various areas and can reach nationally. You only need to mount, in essence, one production effort. If it is put on NBC, CBS, ABC and PBL, your reach on that show is going to be up to 60 or 80 percent if put on at the right time of day, but it is very effective for reaching the public, and our school system is nationalized as you reach every teacher in the room every day.

So I think there are cost deficiencies between the two which, in essence, would make the public education somewhat less per public message imprint.

Mr. **Brademas**. Thank you.

Mr. Hansen?

Mr. **Hansen**. Thank you, Mr. Chairman. We appreciate the thought you have obviously given to the matter of working out a detailed blueprint that would implement this legislation. It has been some of the most helpful information in this area that we have had during the course of the hearings.

My question relates to the role that you think the noneducational institution or organization might play in this effort. As I look at your proposal, much of the effort is being channeled through the formal educational system. I am a little unclear on the extent to which the public education function will be carried out by the regular educational institutions or by others.

I am thinking specifically of the local conservation groups who may have some particular knowledge and talent, and certainly the interest, that may be able to carry out some of the educational programs contemplated by this bill.

Mr. Hunt. Well, sir, from the standpoint of the public education market for the adult education that is outside the channels, there are a number of vehicles and media that can be used. We have not only the local conservation organization, you have museums, you have television, you have a suggestion that was made last week, a reading society; you have the store front museum, you have fairs that could move around. There are a number of vehicles that could be used, and I would certainly hope that the local conservation organizations would be involved in this or perhaps would sponsor some.

I think their participation is necessary. After all, there is a great inventory of knowledge and concern in those groups, and they should be included to every extent possible.

I would be distressed if the problem of the public education were sensitizing the vehicle. If we only chose one vehicle it would be a disastrous mistake.

There are people in this country who don't own television sets and might not have the basic educational background to understand the problems if they were on television.

So I think the strategy from public education is one of moving on as many grants as we can find which would include the conservation organizations. Certainly, if they were running short of funds and had a specific local problem they were working on, I think they should be eligible for grants of some sort.

I don't mean to imply I would like to exclude them in any way.

Mr. Hansen. Do I gather that you would contemplate that noneducational institutions would probably play a major role in what you term "public education"?

Mr. Hunt. Yes, sir; I do. I see that outside of the sphere of formal education.

Mr. Hansen. I see that you agree also that to the extent of materials and techniques, methods have been developed that can be effective in teaching environmental education where even private business groups might very well utilize those materials in the programs that they would organize, even though they paid the cost of their own programs.

Mr. Hunt. I would hope they would get involved. It involves us all. I would like to see as many people involved as possible from the business community as well as the governmental and educational institutions.

Mr. Hansen. My point is that they could benefit from the passage of this bill even though funds were not channeled to private organizations.

Mr. Hunt. Yes, and that follows, and if methodologies were developed by themselves under this bill, it would be something developed by themselves and material would be hopefully available to them.

Mr. Brademas. Mr. Hunt, I have a couple of more questions. I was interested in your statement of environmental education in other countries, and Mr. Hansen and I are also open to suggestions of travel elsewhere seeking knowledge.

From your own experience, are there other countries that have really made progress in this whole field that might be useful for us to know more about?

Mr. Hunt. I can't really answer that, sir. I picked up the fact that Sweden did have a public education or an adult or continuing education program on environmental matters through, I think, the October 10 issue of Science magazine.

There was a very short description saying that they had initiated such a program, and we will find out about it as a model for adult education this summer, which is the purpose of my trip this summer, or one of the reasons for going to Europe.

Mr. BRADEMAS. Well, I hope following your visit, you will be good enough to let us know what you have learned, if that would be possible.

Mr. HUNT. I would be happy to submit a report on it.

Mr. BRADEMAS. But I hope by the time you are there we have acted on this bill.

Your testimony has been very helpful, particularly because you obviously have taken a good deal of time and gone to a great deal of effort to put together a proposed budget which no one else has done for us.

I know Mr. Hansen and I are most grateful to you.

Mr. HUNT. Sir, would it be possible to make those two previous communications part of my statement?

Mr. BRADEMAS. Yes, of course, they will be.

(The documents referred to follows:)

PETER HUNT ASSOCIATES,
Bronxville, N.Y., February 25, 1970.

Representative JOHN BRADEMAS,
Chairman, Select Subcommittee on Education,
Washington, D.C.

DEAR REPRESENTATIVE BRADEMAS: I have reviewed H.R. 14753, and I am grateful for the opportunity to present my comments for your Subcommittee's consideration. Since my background is in systems analysis and the economics of environmental control rather than education I will limit my specific remarks to the operational and procedural elements of your Bill.

However, before entering the specifics I feel compelled to register my general endorsement on the underlying concept. The fact that any effective action in the field of environmental affairs must stem from an informed and concerned public at large is without question. The government and courts can only help in supporting and aiding the latent desires of the people. Your bill serves the governmental function responsibility because it is directed at cultivating and stimulating the public's awareness of the consequences of continued deterioration of our world's environmental quality. Without an educated and sensitized public I can see little hope of making the necessary corrective decisions that will involve short term but real sacrifices on the part of every citizen.

Fundamental to my following comments is the point that any corrective action is highly sensitive to time. Costs of a given solution increase exponentially over time and may indeed pass a point of no return where a correction becomes impossible. Because of this there is a deserved sense of immediacy about environmental problems. We can never bring back the passenger pidgeon. It is extinct. We should not attempt to bring back Lake Erie since we could get so much more for the required money if we spent it on other lakes and rivers.

General Comment to the Mechanism or Structure of Implementation.—Because of this critical element of time I feel the managerial structure you have outlined in the bill runs a danger of being top-heavy and too clumsy to move with the aggressiveness and dispatch that the problem justifies.

Size and Duties of the Advisory Committee.—A Committee of 21 members is far too big to be able to handle the duties of managing the program as you have outlined. A group of 20 part-time peers and a chairman borders on the unmanageable. To do an adequate job on a problem of this serious nature the management group should be much smaller and work full time at substantial compensation.

Recommendation.—That the Advisory Committee be limited to 5 members. That these members be appointed for rotating 3 year terms and be compensated on the basis of fulltime employment.

Location and Managerial Level.—As outlined in the Bill the operating organization responsible for the implementation of this effort would lie deep in the Department of Health, Education and Welfare, below the Secretary, below the Commissioner of Education and below the proposed Advisory Committee, remote from the Congress and the President. Rather than hide the operation away in the dark corners of the bureaucracy, I wonder if it might not be more effective in a more prominent position; perhaps within the Office of the President reporting to the newly formed Council on Environmental Quality, provided with their own funding and easier access to the Congress. In such a slot the managerial Advisory Committee would doubtlessly improve their liaison with external agencies. Federal Departments, state and local educational institutions and non-profit organizations.

Recommendation.—That the managerial Advisory Committee and their accompanying staff responsible for the implementation of this concept be placed in the office of the President and report directly to the Council on Environmental Quality. That they be funded separately by the Congress.

Funding Approval.—The third qualification for the approval of funds which requires that the funds be supplemental rather than replacement may prove a stumbling block. If taken to the letter it would place an unreasonable burden of proof on the applicant to show no other source of funds was available. In addition, it could mean that the federal funds made available would be for the most part on the marginal end of the efficiency curve. I believe I understand the intent of this qualification but as stated it seems unduly restrictive. I sense a danger in its interpretation.

Recommendation.—That qualification 3 of section 4(a) be removed and the decisions on this subject, of whose obligation it is to fund a specific program and to what extent the federal government should support it, be left to the discretion of the Advisory Committee.

Scope.—Although the nation has a large number of environmental problems that are purely internal, there are also many that are international in scope. The Lake Erie mess has had an impact on Canada as have the problems of water management in our Southwest influenced Mexico. The dumping of sewage sludge in international waters could have much broader implications.

In recognition of this I feel that the opening concept statement of your bill should be internationalized. This would in no way preclude a heavy focus of effort on domestic problems but would give notice that we understand that many problems will involve international cooperation for their solution.

Recommendation.—That the scope of the opening concept statement be changed to recognize that many environmental problems are international in character and require more than a domestic view of the situation.

Funding of the Environmental Quality Education Act.—Although it may seem premature I believe there is much to be gained by developing preliminary estimates of the funding that would be required to implement the Act. First, by going through the exercise of developing a budget, one is forced to closely define the various areas of effort, the dimensions and interrelationships of the staffs assigned to each work effort and make some projection of the results or outputs of the organization. Second, by so doing it puts the executive branch on notice that the Congress takes a very serious view of the problem and provides the executive with some performance guidelines as to what the Congress expects to happen. Third, it provides a focus for specific discussion among the members of the Congress in the formative stages of the Act's development.

Recommendation.—That a tentative five year budget be developed for the setup and subsequent operation of the organization responsible for the enforcement of the "Environmental Quality Education Act."

Other Sources of Comment or Testimony.—As stated at the outset of this review my experience in the field of Education is limited. I do know of two people whose comment or testimony from the stand-point of professional educators could prove valuable. They are both interested in the problem of environmental education and should be contacted. They are: Mrs. Jacquelyn Mattfeld, Dean, Sarah Lawrence College, Bronxville, New York 10708; Mrs. Trudy Pratt, Northfield, New Milford, Connecticut.

In addition to the above, it is my understanding that Sweden has recently initiated an Adult Education program for its citizens on Environmental Problems. A witness knowledgeable on their program and its accomplishments might also have something significant to contribute.

In closing I would like to express my appreciation for the opportunity to comment on H.R. 14753 and state my unequivocal endorsement of its concept and intent. If there is anything else I can do to further its enactment, please feel free to call on me.

Respectfully yours,

PETER S. HUNT.

PETER HUNT ASSOCIATES,
Bronxville, N.Y., March 20, 1970.

Representative JOHN BRADEMAS,
Select Subcommittee on Education,
Committee on Education and Labor, Washington, D.C.

DEAR REPRESENTATIVE BRADEMAS: In response to your request I have prepared some definitive material on your proposed Environmental Quality Education Act (H.R. 14753). Please recognize that these plans and budgets are cursive and a product of my personal analysis of the intent of your bill. To expand them into a definitive plan of action would require a deeper investigation of the resulting law.

The attached documents are:

A. An organization chart depicting the structure, location and managerial relationship of a group to accomplish your bill's objective.

B. A five year manpower schedule describing the flesh and blood of the requisite management group.

C. A five year financial budget describing the fiscal requirements needed to both support the Federal management group and provide the monies for the development, test and field implementation of the plans.

D. A Matrix outline of the development phases and educational markets being approached.

E. A proposal and comparative analysis of three alternative Environmental Curriculum Change models for Kindergarten through seventh grade (K–7) prepared this fall by myself, Dr. John Swayze and Eugene Ruth.

In summary, I believe that the cumulative, undiscounted funds (constant dollars) required for your program will run about $65 million, or about 6¢ per capita year. In other terms the cost of the entire five year effort is equivalent to the cost of one SST. Of this total amount approximately 7% would be devoted to administration with the remainder being spent in educational institutions, television and publications.

You may note in the budget I have adopted a strategy of emphasizing public education and the primary and secondary educational fields. I strongly suspect that if these groups are sensitized to the problems the other suggested markets will find it desirable to educate themselves as to the severity of the problems. In addition, one can anticipate a certain amount of spill-over to the lower priority markets from the schools through student-parent contact and from the public (Adult) educational program. There is no need to add a carrot to the Public Service Personnel, Community and Industrial leaders or Private and Government Employees when a whip will suffice.

The one element missing from the proposed plan is a detailing of the outputs of the effort. That is: how many people would be reached with each message: how frequently they would be impressed; what changes in behavior one could anticipate.

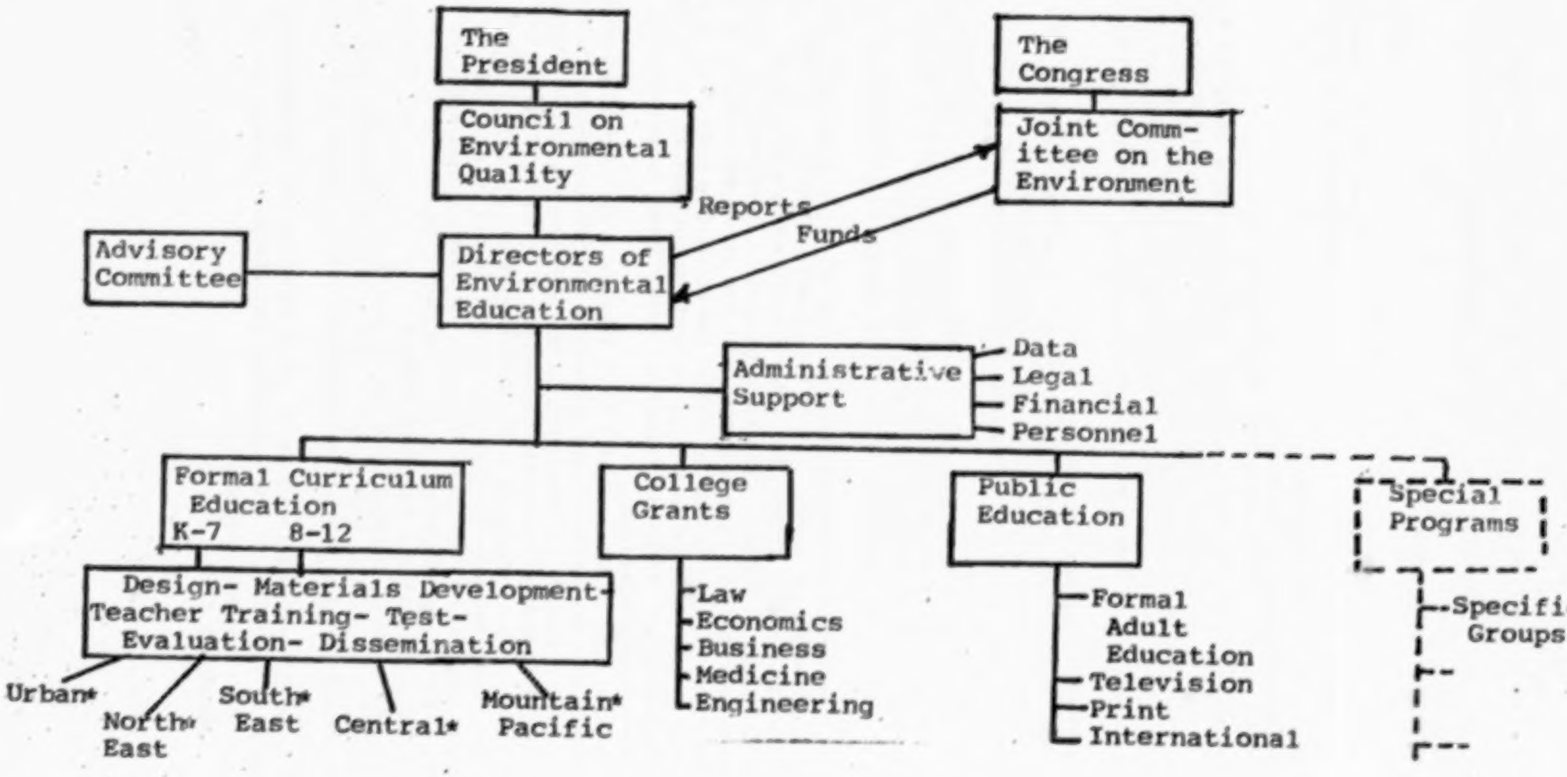
I hope this material will be of some value to you in modifying and gaining passage of your Bill. If you would like any further explanation of this material please don't hesitate to contact me.

Sincerely yours,

PETER S. HUNT.

Environmental Quality Education Act

Organization, Location and Managerial Relationship of Operating Group


The President
The Congress
Council on Environmental Quality
Joint Committee on the Environment
Reports
Funds
Advisory Committee
Directors of Environmental Education
Administrative Support
Data
Legal
Financial
Personnel
Formal Curriculum Education
K-7
8-12
College Grants
Public Education
Special Programs
Design- Materials Development- Teacher Training- Test- Evaluation- Dissemination
Urban*
North* East
South* East
Central*
Mountain* Pacific
Law
Economics
Business
Medicine
Engineering
Formal Adult Education
Television
Print
International
Specific Groups

* Specific curriculum for each area

5-YEAR OPERATIONAL MANPOWER PLAN

Element	Year 1	2	3	4	5
Advisory board	7	10	10	10	10
Directors	3	3	3	3	3
Formal curriculum education	1	1	1	1	1
K–7	3	3	3	3	2
8–12	3	3	3	3	2
College grants	1	3	3	3	3
Public education	5	7	7	5	5
Special programs				1	1
Administrative support	5	5	5	5	5
Total professional	28	35	35	34	32
Secretarial	17	18	18	18	18
Grand total	45	53	53	52	50

[In thousands of dollars]

Element	5-year budget 1	2	3	4	5
Operations:					
Advisory board	7	10	10	10	10
Secretary	8	8	8	8	8
Directors	120	120	130	130	130
Staff	505	704	704	672	570
Secretary	128	136	136	136	136
Supplies and miscellaneous	60	80	90	90	90
Total[1]	829	1,058	1,078	1,046	944
GRANTS AND EXTERNAL EXPENSES					
Formal curriculum education:					
Kindergarten to 7th	680	1,180	1,180	890	2,090
8th to 12th	680	1,180	1,180	890	2,090
College grants[2]	100	450	500	700	700
Public education	3,000	7,000	9,000	12,000	15,000
Special programs				100	200
Consulting services	20	40	40	40	40
Total	4,480	9,850	11,900	14,620	20,120
Grand total	5,308	10,908	12,978	15,666	21,064

[1] Excludes space and utilities.

[2] Excludes capital grants.

EDUCATIONAL MARKETS

Implementation phases	Formal education K–7, 8–12, C	Public service personnel	Community and industrial leaders	Private and Government employees	General public
I. Develop Curriculum:					
Planning					
Material					
Educator training					
II. Demonstrate					
III. Evaluate:					
Material					
Educator training					
IV. Dissemination					
V. Monitor and control					

NOTES

Strategy—With this number of markets to be served some priorities will have to be established as to the areas of heaviest emphasis. In line with this it is recommended that the dominant thrust of early funding be directed at the Formal Educational market, particularly K–7 and 8–12 and the General Public.

Rationale—With these two markets sensitized to the criticality of the situation the remaining three markets can be counted on to educate themselves. In addition to this the General Public program would be available to all of the remaining markets and the Formal Educational program filter into the general market through student parent contracts.

ENVIRONMENTAL PROBLEMS CURRICULUM—A PROPOSAL FOR CHANGE

RATIONALE

Massive environmental problems face our world today. Given the indisputable fact that the resources of Earth are limited, these problems assume such proportions as to give them the highest priority among all other—admittedly grave—world situations; if the Earth should cease to support life, other problems would lose their significance immediately and totally.

During the past few decades, various individuals have noted the despoliation and destruction of our water, our land, our wildlife, our natural vegetation, our very air. These prophetic voices went unheard or unheeded. The last five years have seen other men of intelligence and good will attempt to grapple with these problems; though worthwhile, most of their efforts were carried out in isolation, without reference to the total situation. The results are minimal so far as actual change is concerned, though public awareness has been increased.

Meanwhile man continues to ravage his physical resources with increasing swiftness. It is difficult, and perhaps impossible, to overestimate the danger, both present and future, of this situation. Indeed, evidence suggests that unless man can bring controls upon himself, he will cease to exist as a life form on Earth, having destroyed systems upon which he is vitally dependent. To continue under the fictive belief that we can redeem things once they reach crisis proportions (if they have not already) is sure suicide. We must begin now with all the urgency we can muster to redress the balance between man and his world which is so essential to man's survival.

What is happening to our physical environment, its continuing and growing threat to human survival, demands both political action and research/analytical capacity to deal with the problems. The American system of government further demands an informed electorate and a steady flow of qualified personnel to staff the control effort. It is essential that a massive educational program be undertaken. As part of this effort, we suggest the introduction of environmental studies into our public school systems. Although the Federal Government cannot impose such studies, it can and should encourage it by taking a leadership role in preparing and funding distribution of the necessary course materials and teacher-training.

However, it must be said that educational changes generally take decades. Dr. Paul R. Mort of the Institute of Administrative Research of Teachers College, Columbia University once noted that only under extraordinary circumstances and with great expenditures of money and effort can changes be compressed into months or even a few years. He gave an example of this when the United States Air Force during World War II was able to implement a pre-pilot training program in one-half of the nation's high schools in one year's time.

Although the environmental problems facing us today are of crisis proportions matching if not exceeding those of the early 1940's, there is just the beginning of urgency and concern among the general public. Thus, without the resources of mass media promotion and creation of national concern, significant change will require even greater effort; something which innovators must realize so that they will persist in their work over a long period. This is extremely important as many useful beginnings will lose their thrust for lack of long term pressure on the system and lack of proper expenditure of time and funds at the dissemination phase.

This proposal deals with the educational function at the elementary school level. It has been designed with the hope that similar efforts will be created for secondary and college curricula. Three alternative plans were examined, each differing in respect to time required for degree of implementation, cost, and expected level of effectiveness.

The first and recommended one, the Independent Design, Evaluation, and Dissemination Plan, would require five to seven (5–7) years for completion and cost $5,000,000 to $10,000,000. This program begins with a Concept Conference involving scientists, economists, politicians, and private industry. Their knowledge would help shape and direct a program of materials for use in our public elementary schools. The unique feature of this plan is that it provides time and funds for the independent evaluation and dissemination of materials.

The second one, the Dependent Design, Evaluation, and Dissemination Plan, would take four (4) years and cost approximately $3,000,000. This plan differs from the first in that it would be developed for integration in the already existing national curriculum studies and/or the regional university-school research and development centers.

The third one, the Independent Design Plan, provides for the design of materials and leaves the evaluation and dissemination processes to commercial publishers. This plan would cost approximately $2,000,000 to prepare appropriate materials for commercial publication: if materials were left in prototype form there would be a saving of approximately $1,000,000.

SUMMARY

Plan I: $6,020,000.—Time: +5 year production and test; +10–15 full implementation.

Effectiveness: probability high and will have immediate impact through parents of children; it is thoroughly tested; it will have impact and will resist submersion in school systems.

Plan II: $3,280,000.—Time: +4 year production; +20 year to full implementation (will probably be replaced).

Effectiveness: although easy to accept in concept, it runs a high risk of being submerged; it has low parent impact.

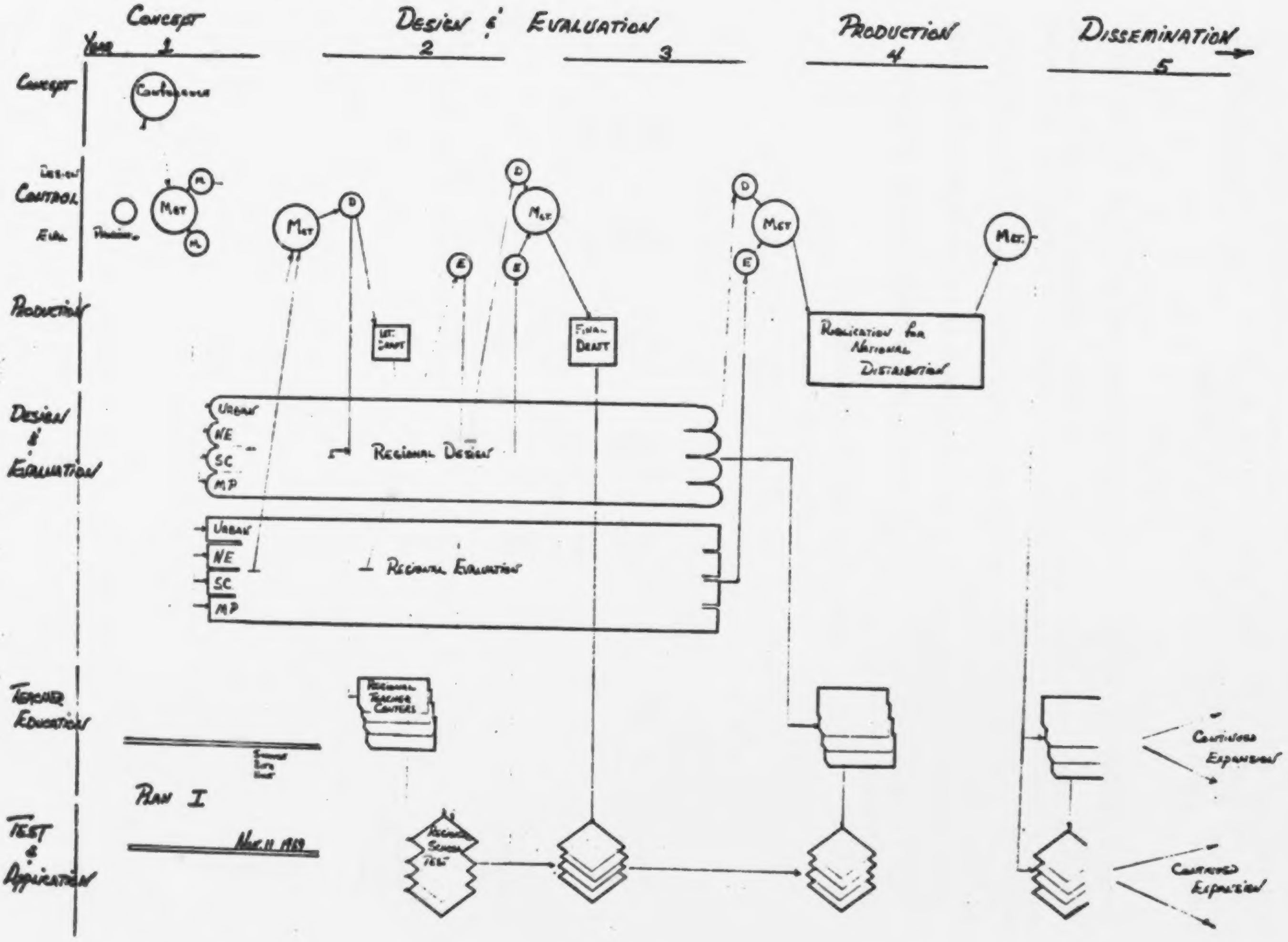
Plan III: $1,040,000.—Time: +3 year production; implementation unknown.

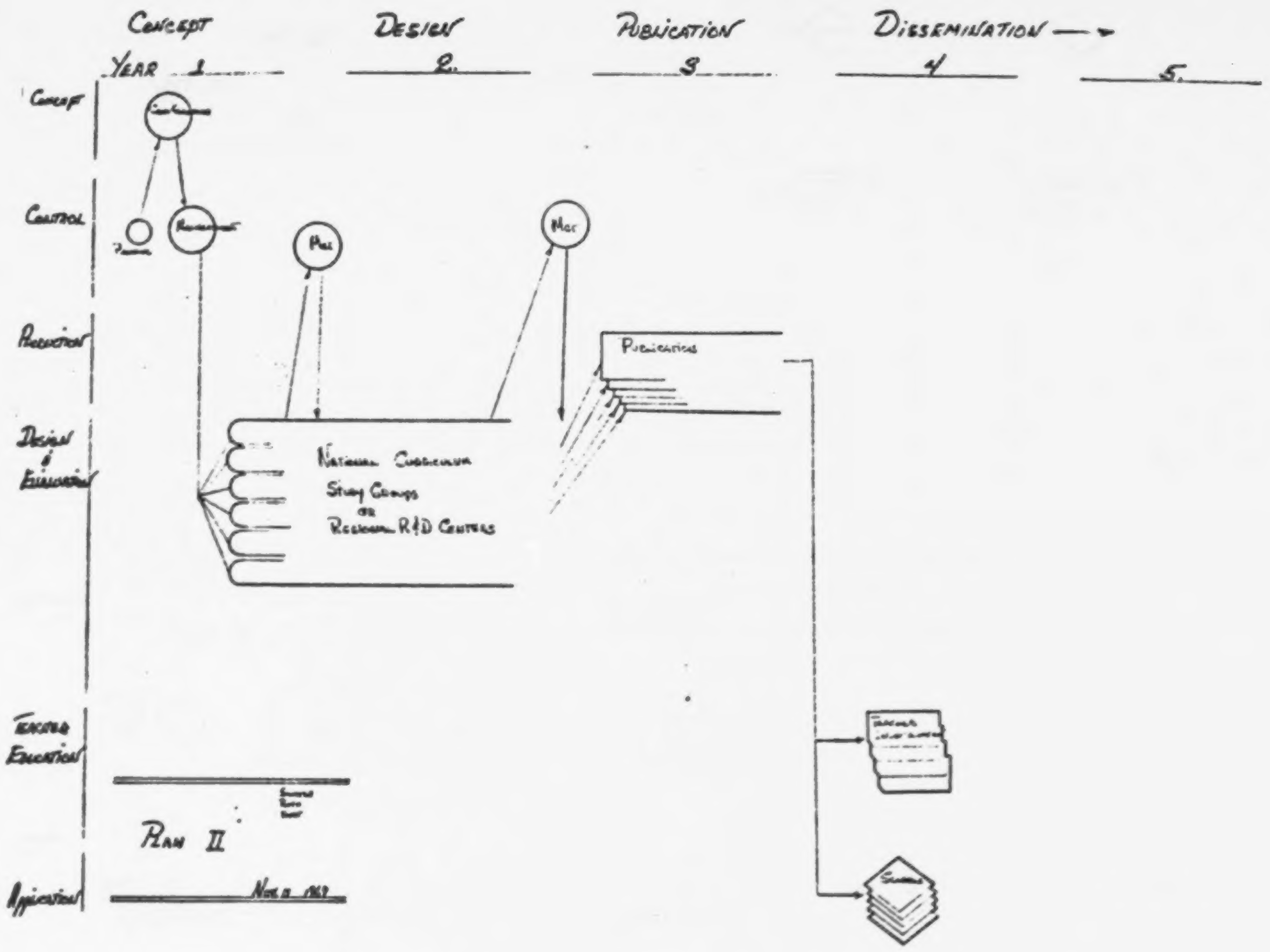
Effectiveness: it has low probability.

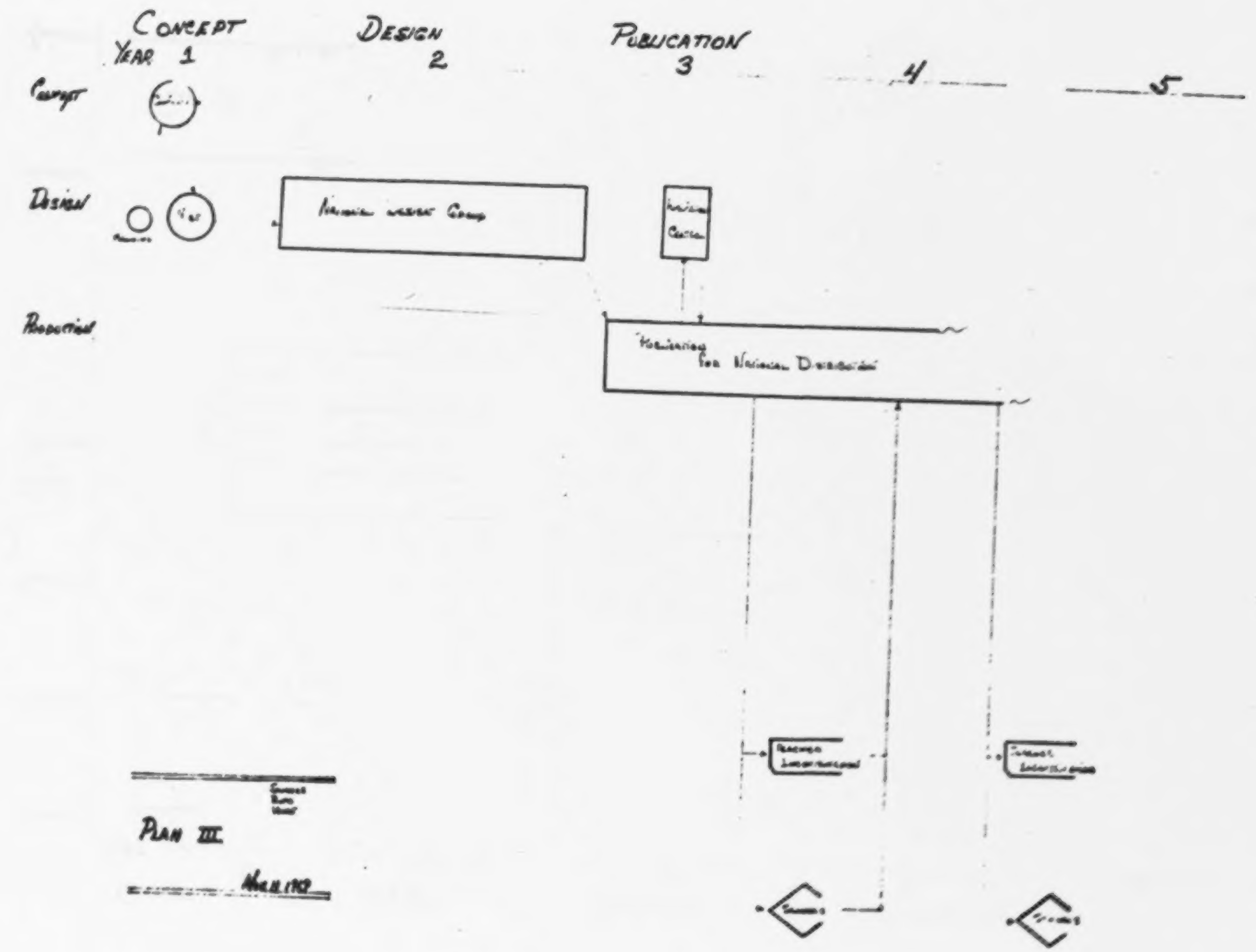
COMPARATIVE FINANCIAL REQUIREMENTS

[In thousands of dollars]

	Year					Total
	1	2	3	4	5	
Plan I:						
National	230	240	240	290	110	1,110
Regional	450	740	740	200	440	2,570
Local		200	200	400	1,540	2,340
Total	680	1,180	1,180	890	2,090	6,020
Plan II:						
National	230	240	110	110		690
Regional	330	660				990
Local			800	800		1,600
Total	560	900	910			3,280
Plan III:						
National	230	510	300			1,040
Regional						
Local						


Concept
Design & Evaluation
Production
Dissemination
Year 1
2
3
4
5
Concept
Conference
Design
Control
Eval.
Met
D
E
Production
1st Draft
Final Draft
Publication for National Distribution
Design & Evaluation
Urban
NE
SC
MP
Regional Design
Regional Evaluation
Teacher Education
Regional Teacher Centers
Continued Expansion
Plan I
Test & Application
Nov. 11 1969
Regional School Test
Continued Expansion


CONCEPT
DESIGN
PUBLICATION
DISSEMINATION
YEAR 1
2.
3
4
5.
Concept
Control
Production
Design & Evaluation
Teacher Education
Application
Pac
Mac
National Curriculum Study Groups or Regional R&D Centers
Publications
Plan II


CONCEPT
YEAR 1
DESIGN
2
PUBLICATION
3
4
5
Concept
Design
Production
PLAN III

Mr. BRADEMAS. Before I introduce our final witnesses for the day, the chair might take a moment to announce that the next hearings on this legislation will be held on Tuesday of next week, April 21, in this room at 9:30 a.m. when we shall hear from the U.S. Commissioner of Education and Assistant Secretary of Health, Education, and Welfare for Education, Dr. James E. Allen, Jr.; Mr. Leslie L. Glasgow, Assistant Secretary of the Interior for Fish and Wildlife, Parks and Marine Resources; The Honorable Sam Gibbons, Member of Congress from the State of Florida; John Osman, Staff Director, Urban Policy Conference program, Brookings Institute; and Jefferson B. Fordham, president, Association of American Law Schools; Dean, University of Pennsylvania Law School.

We are now very pleased to welcome an old friend of this subcommittee, Dr. John Lumley, the Assistant Executive Secretary for Legislation and Federal Relations of the National Education Association, accompanied by Dr. Donald Hawkins, the Director of Project Man's Environment.

Dr. Lumley, it is good to see you, sir.

STATEMENT OF DR. JOHN LUMLEY, ASSISTANT EXECUTIVE SECRETARY FOR LEGISLATION AND FEDERAL RELATIONS, NATIONAL EDUCATION ASSOCIATION; ACCOMPANIED BY DR. DONALD HAWKINS, DIRECTOR, PROJECT MAN'S ENVIRONMENT

Dr. LUMLEY. Thank you, sir. It is always a pleasure to be here, as you know.

I brought with me a statement from the Association of Classroom Teachers, prepared by Betty I. Buford, president. She asked that it be included in the record.

Mr. BRADEMAS. Yes.

(The statement referred to follows:)

STATEMENT OF THE ASSOCIATION OF CLASSROOM TEACHERS, NEA BETTY I. BUFORD, PRESIDENT

The Association of Classroom Teachers, NEA, representing approximately 900,000 classroom teacher members of the National Education Association, is constitutionally committed as an integral and vital part of the parent association to keep classroom teachers aware of their responsibility to provide quality education for all.

Classroom teachers are extremely concerned that all segments of American society must immediately receive intensive education in the multi-faceted realm of environmental education and ecology. Early and immediate involvement of those charged with the education of our citizenry from kindergarten through grade 12 and beyond in the development of curriculum and materials is the thrust of the resolution adopted by some 4,000 delegates to the classroom teachers representative assembly July 1969 in Philadelphia, Pennsylvania. ACT resolution 69-31 states:

"ACT recognizes the lack of awareness and understanding among students of environmental problems relating to the technological age. It believes that understanding these problems can make possible proper reassessment of value judgments of the natural environment so that man's right to life can be protected. ACT therefore recommends that state boards of education develop curriculum studies of ecological and environmental problems for kindergarten through grade 12. It further recommends that classroom teachers promote understanding of the need for such studies in their communities in preparation for implementation of such curricula in local school systems."

As first steps to this end, offices and staff of the Association of Classroom Teachers have been pleased to lend their support to efforts of NEA's Project Man's

Environment (ME) with particular emphasis on curriculum evaluation and participation in exploratory meetings to examine possible approaches to a nationwide program of environmental education in the United States.

The thrust of H. R. 14753, the Environmental Quality Education Act, is consonant with the objectives and purposes of the ACT resolution and would facilitate implementation of common goals. The Association of Classroom Teachers particularly calls to the attention of the House of Representatives Select Subcommittee on Education the intent of the ACT resolution that there be immediate and massive grass roots involvement of public school personnel on a total spectrum. This is implied in H.R. 14753. It is urged that the mechanisms be more thoroughly and carefully delineated so there can be no misinterpretation of this concept.

The Association of Classroom Teachers stands ready to serve in any capacity to provide information, serve as reactors, or work for passage and implementation of the act when passed.

Mr. LUMLEY. My name is John Lumley. I am assistant executive secretary for legislation and federal relations of the National Education Association, a voluntary professional association chartered by Congress more than 100 years ago. At present, we list more than a million members, most of whom are teachers.

It is with a good deal of pleasure and enthusiasm that I applaud the leadership and initiative of the authors of the proposed Environmental Quality Education Act (H.R. 14753). I also want to thank them and the members of this committee for the opportunity to present our views on this important topic.

For the record, it seems appropriate to cite the resolution on environmental education passed by the NEA last summer:

> The National Education Association believes that each school system, in shared responsibility with classroom teachers, must continuously evaluate its curriculum, keeping it ever sensitive to the current and future needs of students.
>
> The Association recommends that each school curriculum reflect concern for such critical issues in our present society as: a. environmental education; b. American heritage; c. traditional American values; d. mental hygiene; e. safety education; f. conversion to the metric system; g. contributions of minority groups; h. cultural diversity; i. democratic processes; and j. human ecology.

This resolution is not mere rhetoric. Not only has there been much planning and discussion of the need for a better and broader understanding of the qualities which make for a better life and for the preservation of our human and national resources, but we also have established, as of last August, Project Man's Environment (ME), operated by our national affiliate, the American Association for Health, Physical Education, and Recreation here in Washington at the NEA center. Dr. Donald Hawkins, director of project ME, is here with me to provide additional information and technical advice should this be indicated.

Obviously, we welcome Federal funds and support in moving toward curriculum improvement. We see no evidence of Federal control in the present legislation although we would welcome an explicit prohibition to this effect, if only to assert once again that traditional State and local control shall prevail.

In the same vein, I would like to suggest that you may wish to give the pending legislation a new thrust and a different organizational pattern. In short, we would like to see the preparation of educational and information materials dealing with environmental education placed under the auspices of an autonomous, nonprofit public institute or corporation, more or less along the lines of the Urban Institute, or the Corporation for Public Broadcasting—a body with its own trustees, staff, funds, and a specific mandate.

This new institute will be in a position to seek out suitable talents on a short-range basis as well as for long-term commitments, and it could do so without the potential hazards of a Federal operation. The composition of the board of trustees should guarantee representation to all segments of the education community at the grassroots level and provide adequate voice for classroom teachers and other educators.

This National Center for Environmental Education should be broadly based and broadly supported, permitting Federal as well as private funds. Our environment now suffers from a fragmented approach which we are now seeking to overcome through new organizational devices like the three-man Environmental Quality Council and pending proposals for a Joint House-Senate Committee on the Environment.

The proposed center could be a means for coordinating our environmental education efforts, a rallying point for the various Federal agencies now seeking to improve environmental understanding and awareness.

Instead of relying exclusively on new funds, we are eager to provide a place where other Federal activities can be brought together for better coordination into a synergistic effort—which is not the same as a monopolistic effort.

At present, there are environmental education activities—including adult education and community awareness—funded and sponsored by the U.S. Office of Education, the National Science Foundation, the Feederal Water Pollution Control Administration, the National Air Pollution Control Administration, the National Park Service, the Bureau of Outdoor Recreation, and others.

These separate projects reflect the administrative divisions and the mission-oriented tasks of the funding agencies. Until such time as these agencies can be better coordinated, it makes sense to recommend the proposed nonprofit, publicly controlled center as a focal point.

The bill now before us does not contain a specific authorization figure. We visualize about $12 million per year as adequate for support of the center, including the sums to be disbursed through grants and contracts for the development and evaluation of curriculum materials and other informational and educational devices as described in H.R. 14753.

For the first year, we recommend even less than that—something like $2.5 million to get things off to a good start with the bulk of the money to be devoted to planning, program development, selection of qualified staff and consultants, and other organizational and startup expenditures, probably including manpower development with specific provision for paraprofessionals.

Having recommended this relatively modest amount, however, I want to make quite clear that we are looking for the payoff to come after the first year, extending over about 5 years. In other words, we would like to see you authorize a center for about 5 years, beginning with a year of planning with modest financial support, then 4 years of active operation, concluding with a modest phasing-out budget to permit evaluations and research to reflect back on the work of the previous 4 or 5 years.

For the record, we do not preclude the possible renewal of the lifespan of the center; its work may well be needed for decades ahead, especially in the context of technological change and the obsolesence of much of our knowledge.

What is clear is that a center like this, if it is to attract first-rate staff, should not be subjected to the annual struggle over authorizations and appropriations which is counterproductive and would interfere with the continuity of its work. There is a precedent for a 5-year authorization; there is even precedent for long-term appropriations—as demonstrated by the original Smith-Hughes Vocational Educational Act.

The proposed bill puts strong emphasis on the development of curricula and demonstration projects in the schools. This is definitely needed and we also see the need for a planned impact on our adult citizens.

President Nixon, in his statement of May 29, 1969, put it this way:

> Together we have damaged the environment and together we can improve it.

Surely this damage was not deliberate. It reflects a lack of knowledge and understanding, especially understanding that our technological advances have brought with them certain unintended consequences which call for new ways of dealing with our surroundings. I see the pending legislation as a major vehicle for achieving this kind of new understanding.

It has become almost trite to say that we live in an age of change. What has not yet become trite is the impact of some of these changes. To quote the President again—state of the Union, January 22, 1970:

> We will think of air as free. But clean air is not free, and neither is clean water.

More or less the same thing can be said about most of the inroads being made into our environment:

> Noise pollution is the byproduct of the machines and engines which have become our servants, which are our means of transportation, which wash our dishes and cool the air. They can be made more quiet but this will increase their cost of production and operation in most cases.
>
> Highways are the base of our mobility but they also have sliced through neighborhoods and disrupted them, have gobbled up parkland, and have displaced thousands of our fellow citizens who often did not want to be uprooted.
>
> Automobiles have given us undreamed of mobility but they have also become the chief source of air pollution, an unintended byproduct and one that can be reduced rather sharply if we are willing to pay the additional costs of better fuels and engines designed for lower harmful emissions.
>
> Certain persistent pesticides have contributed to our abundant food supply and unintentionally have become a threat to our health. To cut down on these agricultural tools does not mean starvation but it probably means that we must pay for a better balance between supply and the hidden costs of our abundance.

In giving these illustrations, I do not mean to pose as an expert chemist or engineer. I do mean to suggest that there is a need for a massive educational effort designed to reach all of us—adults and children—

so that we can make more intelligent choices in our daily decisions as we use the abundant devices modern technology has put at our disposal.

Speaking for an organization of more than a million teachers, I am keenly aware of the responsibility we bear in reinforcing the values of our society. This means that environmental education must come to grips with the prevailing values of our society, that its impact must be broad and penetrating lest it wind up as a perfunctory addition to the curriculum when the teacher once a month passes out a leaflet or shows a motion picture because "today is the day when we have environmental education."

We live in a society which measures success by the size of the car and the power of its engine, but has overlooked the damage of its exhaust.

We live in a society in which the media praise the simplicity and convenience of the throwaway bottle without citing the hidden costs of the return trip or the degradation of the countryside with its litter of abandoned cans.

We live surrounded by commercials which praise speed and the glory of the jet airplane, but tries to hide its noise by talking about Whisperjets which howl just as loudly as the others.

We live in an age which is just beginning to take a look at the idea of environmental quality in terms other than quantity.

We are just beginning to question whether "more" and "bigger" and "faster" are really the same as "better."

And we are just beginning to realize that our problem is not so much the danger of running out of natural resources as running out of places to put our garbage.

And very slowly we are learning the technical terms for this garbage which can be broken down into solid wastes and liquid wastes, into residuals and particulates, and which can be quantified by economists who talk about externalities.

Not only is it desirable for all of us to understand the concept of externalities; it is, indeed, crucial that we understand that man is inescapably a part of his environment and that he is dependent upon it for his very survival. Science classes must learn about harmful emissions, about coliform counts, about the difficulties inherent in producing an efficient steam-propelled automobile, but more important it is critical that these same classes be equipped with the values, knowledge, and skills needed to solve the grave problems which they produce.

The essence of environmental education is the change in attitudes and values, the new stance we must take toward nature so that we treat neither the biosphere nor our rivers and oceans as if they were bottomless sinks in which we can dump with impunity the wastes of our affluent and effluent society.

It is in this sense that I urge you to review the pending legislation so that it will have a much broader thrust and impact. It can and should include pilot studies and demonstration projects, curriculum innovations, and teaching techniques. It should also afford an entering wedge for other educational reforms, such as providing for the acquisition and development of environmental study areas by school systems.

Today's hearings deal with environmental education and I share with the members of the committee the hope that they and we will be successful. I ask that environmental education be structured to enrich existing curriculums and provide intensive learning experience in this arena of man's future.

I welcome the idea of using environmental quality as the rallying cry which brings together a wide variety of interests. I note with pleasure that the pending bill is sponsored jointly by Representatives who normally sit on opposite sides of the aisle.

This widespread interest reflects the fact that our lives are at stake. If the alarmists are right, then our survival, our immediate survival is now being threatened. If the alarmists have overstated the case, there remains the fact that we cannot go on as we have been going, that the survival of future generations is threatened.

What seems inescapable is that we must do something now to assure our survival and to stop the degradation of our environment. This is a matter for education which I would like to see defined as education for all Americans and which I would like to see administered through a nonprofit corporation rather than through a Federal agency as being more in keeping with the American tradition of avoiding Federal control and avoiding even the illusion of Federal control over education and other means of influencing public opinion.

If environmental education is to be effective, we really must seek to influence public opinion—we must seek to use a variety of media to enlighten the American public about the turning point we have reached in our use of nature, natural resources, and technology, and we must make the schools a part of this shift in attitudes. Your bill is an important step toward these ends, and I hope that it will open the way for Federal funds, without even a suspicion of Federal control, to become available soon.

We look to you for continued leadership and encouragement and support.

Mr. **Brademas**. Thank you very much, Doctor. I just have a couple of questions. I take it what you are really after is something considerably different in terms of the way it would be organized than the kind of program contemplated in the bill in that you want a national center for environmental education that would be funded from the Federal moneys and from private moneys and would be outside the Government, not in the Department of Health, Education, and Welfare; is that right?

Mr. **Lumley**. That is correct.

Mr. **Brademas**. I am not quite sure, other than the coordinating purpose of such an institution, of your justification for suggesting that.

Mr. **Lumley**. The Urban Institute and the Corporation for Public Broadcasting are both examples of what could be done with Federal money and public money going together to do a job. The same thing could be done here.

Mr. **Brademas**. I am sure it could be done. I have no doubt about that.

The point is, what are the arguments against doing it as part of the Office of Education? Why doesn't the program of environmental education be handled through——

Mr. **Lumley**. I will comment first and then ask Dr. Hawkins to comment.

It is our experience that to get cooperative programs working within the governmental structure is very nearly an impossibility. The Office of Education, as a previous witness said to you, is not top level.

This is not the Department of Health, Education, and Welfare. So when the Office of Education is doing something and asking the Department of the Interior or some other group that has an equity in doing this——

Mr. BRADEMAS. Of course, that is a problem common to almost any kind of program; that the Federal Government is into a program and it affects nearly everyone else and nearly everyone wants to be at the White House level.

Mr. Hunt said he wants this to be through the President's Council on Environmental Quality. Why doesn't this type of program be operated under the auspices of the President's Environmental Quality Council?

Mr. LUMLEY. As far as bringing about the cooperation of the various agencies, that would do it, of course. But I am not too sure that securing the support of all of the public bodies would necessarily improve them any. The semipublic agency we are recommending would do it better.

Now, I will ask Dr. Hawkins of our Project Man's Environment to comment because I am sure they have been studying this as to what they believe and why it would be most important.

Mr. HAWKINS. Thank you. Mr. Chairman, so often we set new directions in education as a response to public concern and then develop legislation, special appropriations, and an administrative base, and think such actions are the answer to the problem.

The environmental problem is a bureaucratic maze at this juncture, and it is the same with the educational aspects of the environmental problem.

This morning we have heard a number of points of view expressed: a strategy toward adult education, the use of communications through public broadcasting, and others. But we also have several other issues which have not been raised. Experience-based learning means that the leaner should be exposed to ~~the~~ concrete and real world.

Referring to your earlier question related to identifying international environmental education models, perhaps we should study those programs in England which use classrooms without walls where the total environment is used as a learning laboratory. Why simulate the environment, no matter how sophisticated you get, if you can have the real thing?

I would also refer to the President's message of February 10 on the environment where he proposes that we adopt a new philosophy for the use of federally owned lands, treating them like a precious resource, as money itself, which should be made to serve the highest possible public good, such as multiple use of land and water resources for recreational and educational uses.

As we know, he formed a property review board to review the GSA reports on land uses. I would also point out that recently the Secretary of the Interior has endorsed a program called the National Environmental Study Area program. He also has asked every agency in the Department of the Interior to provide him with a report on how the resources controlled and managed by the Department of the Interior might be used for educational purposes.

I would submit that perhaps our suggestion for a relatively short-term independent agency is based on the reality that many Federal agencies are involved in this issue. Business and industry are involved. The consumer is becoming aroused.

At the same time, with this critical mass of talent and resource amassed in a National Center on Environmental Education, we would still be able to tap existing appropriations and hope that some of the present fund allocations could be reevaluated and new priorities set which reflect the importance of environmental education.

Mr. Lumley. If we have this Center in the Office of Education or any other Government agency, there will tend to be a narrower concept than if you have this larger, more independent body. In other words, we would be definitely talking about the school curriculum. We would get into deeper education, of course, and we would get into continuing education. But I am not too sure we would get the whole broad spectrum we could get—the spectrum that the Corporation for Public Broadcasting has gotten.

Mr. Brademas. That almost persuades me, but not completely.

But your testimony, gentlemen, has been most helpful.

Mr. Bell.

Mr. Bell. Thank you, Mr. Chairman. Doctor, you mentioned environmental studies. How are you going to handle the training of teachers? What would you do about that?

Mr. Lumley. Well, the curriculum material for the training of teachers would be developed by the staff of this agency that we are talking about.

These materials would be made available to teacher training institutions, to the school districts for inservice training of teachers. And we would also use every means that is available now, whether it be TV broadcasting or radio or the classroom, whatever it might be. You have to do for environmental studies what we have done for teachers in other subjects.

Mr. Bell. Yes. But you would have to start a whole new method of teaching, would you not? This is kind of a different approach to the problem.

Mr. Lumley. I am not too sure, Mr. Bell, that it would be necessary. There might be some changes, but the training of teachers has changed drastically within the last 4 or 5 years because of the needs of society. Before that we were probably a conformist group.

Mr. Bell. Yes, I know it has changed, but not as far as you may be suggesting here by some of these programs.

Mr. Lumley. The education profession is constantly changing. The Education Professions Development Act provided for new training. The job of the staff of this public corporation would be to make materials available for the training of teachers.

Mr. Hawkins. One of the most interesting aspects of this bill is that the terminology "community education" is used. Community education goes far beyond simply preschool and adult education. In fact, as Arnold Toynbee says, "No longer can we separate life into a learning stage and an application stage."

In other words, we are continually learning and applying. It is a continuing lifelong process. Community education also provides opportunities for people to experience decisionmaking and action efforts to improve the quality of their lives. I think that consumer advocacy will have to be included into this program.

In terms of your comments on teacher preparation, I think we need radical reorganization in all of our formal education programs. Too often we go through a program of preschool to the post-Ph. D. level, and we have never really been exposed to an effective environment for learning which has an infinite array of possible responses by the creative learner.

I suggest we get as close to the real world as we can. When this is not possible, we can simulate the environment in a sophisticated way—using media and new communication technologies such as holography, which is a three-dimensional projected image.

At the same time, I think we need more effective transportation systems. It is like bringing Mohammed to the mountain rather than the mountain to Mohammed. Our first concern should be to transport the learner to the learning resource.

Mr. **Bell**. Wouldn't our concepts be scattered in that, though? You would be changing at quite a pace. It is a different approach. True, we are moving gradualy now, but this is going to be quite a step.

Is there going to be any pattern to keep one area from going way out over here and one in the other direction? This is a relatively new concept we have had in more recent years. We have talked about it in the past, and now it is really coming in to its own, and if you move pretty fast, I would see where the approach could be scattered.

This might weaken your system.

We have to reach some kind of a central pattern, it seems to me. Is this your thinking, too?

Mr. **Hawkins**. Well, Mr. Bell, I think we can learn from an old social work principle; you start with people where they are, but you don't necesarily stay there.

We have the reality of formal education as it is now. Our organization represents both the old guard and young Turk elements. We have to work with both groups, and at the same time we have to take advantage of what we know about the science of learning and the art of living.

We need to try innovative programs. The Ford Foundation has invested a million dollars in the English model that I mentioned earlier, and I just feel that schools can no longer be put in the traditional two-by-four-by-six context—knowledge dispensed via the book with two covers, in the four-wall classroom, 6 hours a day.

Mr. **Bell**. Nobody is arguing on that point. I agree there. But I can see where it could go from that to something which is too far in too many different directions on a complicated subject.

Mr. **Lumley**. I would say you go gradually. As I said to you, the method of teaching and how teachers are operating in the schools has changed drastically in the last 5 years.

This would simply be a continuation, insofar as they would have different material. Here you are including environmental educational materials as a part of the teacher's whole background. It has to be related to the teacher in the science class or the teacher in the history class, but the teachers have to have this new knowledge of the facts that they are teaching children.

Now, we were talking about the formal school program, whether it be in the elementary school or high school or even in the college. But in addition to that, the concept that we are putting across here is also community education. We come back to talking again about what the chairman asked me a minute ago.

You see, it is the land-grant idea and what the county agents did for the farmers of this country and what they are still doing for the farmers, and what the home economics people are doing.

This is community education and community participation. This can make people aware of what is going on by using the methods we have. We are not just thinking of the school and what happens from the kindergarten to the 12th grade. We are trying to visualize this whole program of education, and the teachers have to fit in and make their contribution at whatever level they are in.

But I don't believe it has to be a radical change. It has to be a consciousness of the problems and how teachers can contribute, and the materials that are developed by this staff will make it possible for them to do this.

Mr. Bell. Do you think the majority of the teachers are constituted today so as to be able to make this transition, whether it be gradual or quick?

Mr. Lumley. Let me say that I hope they are. And I think the large majority of them would be; yes.

Mr. Bell. Yes, Mr. Hawkins?

Mr. Hawkins. I think your question is a strategy question. I think the longer term goal here is complete reform in the way we diffuse knowledge. We are moving into hyphenated disciplines. Combining knowledge areas which were formerly sacrosanct. We need human ecology and thematic approaches, as an alternative to overspecialization. Perhaps the ecology approach should be designed more for the life of the mind and to improve the quality of our total environment. Perhaps specialization will be more important for vocational development as we move from a work-oriented society to perhaps a quality of life-oriented society.

But I think there is a strategy we could use right now and that is to simply expand the learning opportunities to young people in the concrete real world by encouraging the use of environmental study areas—cultural, natural, historic, urban spaces, sources of pollution—where learning is maximized.

All learning cannot take place in a classroom. Exposure to environmental study courses can be supported by preliminary lessons and followthrough lessons in the classroom. I think that is perhaps why I have emphasized the environmental study approach and the environment facility approach as an immediate strategy, because by changing the environment for learning, by expanding it, something is going to happen to the learner and something is going to happen to the teacher.

Mr. Bell. Thank you, Mr. Chairman.

Mr. Brademas. Thank you very much, Dr. Lumley and Mr. Hawkins. We are very grateful to you for having come.

The Chair wants to take a moment to recognize some of our visitors here today, who I think I am right in saying come from the State of Kentucky. Do you come from the district of the chairman of this committee, Mr. Perkins?

Spokesman. We just wanted to drop in and visit a committee hearing since we have never had that opportunity.

We represent the Kentucky 4-H Older Youth Conference which is here this week.

Mr. **Brademas.** We are particularly pleased to welcome you and, in particular, the Committee on Education and Labor, because the chairman of this committee is one of the most influential Members of the Congress, Representative Carl D. Perkins from the State of Kentucky, who has contributed as much as any member of either the House or the Senate in writing legislation to strengthen the schools of our country.

So Kentuckians are always welcome here, and we are glad to see you here today.

We are now adjourned.

(Whereupon, at 11:30 a.m. the subcommittee was adjourned, subject to call of the Chair.)

ENVIRONMENTAL QUALITY EDUCATION ACT

TUESDAY, APRIL 21, 1970

House of Representatives,
Select Subcommittee on Education,
Committee on Education and Labor,
Washington, D.C.

The subcommittee met at 10 a.m., pursuant to recess, in room 2175, Rayburn House Office Building, Hon. John Brademas (chairman of the subcommittee) presiding.

Present: Representatives Brademas, Meeds, Reid, Bell, and Hansen.

Staff members present: Jack G. Duncan, counsel; Ronald L. Katz, assistant staff director; Maureen Orth, consultant; Toni Immerman, clerk; Arlene Horowitz, staff assistant; and Marty L. LaVor, minority legislative coordinator.

Mr. Brademas. The subcommittee will come to order.

We are very pleased to have as our first witness this morning Commissioner of Education, Assistant Secretary of Health, Education, and Welfare for Education, the Honorable Dr. James E. Allen, Jr.

The Chair would like to observe that he has read with very great interest a splendid address delivered on January 23, 1970, by Commissioner Allen before the American Council of Learned Societies, in which the Commissioner challenges us to participate in a reorientation of American education toward environmental studies.

He went ahead to say the responsibility of the Government is to lead and to develop the environmental orientation programs in our schools as well as at every stage of adult education, and then he concludes by urging among the several activities in which he hoped that members of the Council of Learned Societies support appropriate educational environmental activities.

As a matter of fact, Mr. Secretary, I regard your speech as one of the most perceptive summaries for the purpose of the legislation that we are considering here today, and I am all the more pleased to welcome you here this morning.

STATEMENT OF DR. JAMES E. ALLEN, JR., COMMISSIONER OF EDUCATION, ASSISTANT SECRETARY OF HEALTH, EDUCATION AND WELFARE; ACCOMPANIED BY LOGAN H. SALLADA, SPECIAL ASSISTANT TO THE COMMISSIONER, AND ALBERT L. ALFORD, ASSISTANT COMMISSIONER FOR LEGISLATION

Commissioner Allen. Thank you, Mr. Chairman.

First, I am accompanied here by Mr. Logan H. Sallada of my staff, as special assistant to the Commissioner, who has been a leader in my office in this area of environmental education, and Mr. Albert L. Alford, who you know is Assistant Commissioner for Legislation.

I welcome this opportunity on the eve of Earth Day 1970, to discuss the interests and activities of the U.S. Office of Education in environmental and ecological education, and to give my strong support to the purposes of H.R. 14753.

You, Mr. Chairman, and other members of this subcommittee are to be highly commended for the concern and leadership you have shown with respect to the need for more intensive efforts to establish educational programs to encourage understanding of policies and support of activities designed to enhance environmental quality and maintain ecological balance.

As you know, the President has stated that:

> The 1970's absolutely must be the years when America pays its debt to the past by reclaiming the purity of its air, its waters, and our living environment. It is literally now or never.

Thus, this administration is dedicated in full measure to saving and rehabilitating our fragile, threatened environment, on which our very survival depends.

The Office of Education has a special responsibility in this regard, for one of the keys to survival is education. I would like to tell the subcommittee something of our activities and plans.

Soon after I took office as Commissioner of Education, my attention was particularly drawn to the growing seriousness of the pollution problem by a very excellent short film produced by a group of our summer interns.

Entitled "Crisis in the Capital: When Will We Ever Learn?" and that film I understand will be shown later this morning, this film portrayed dramatically the serious pollution problems in the District of Columbia area. This film increased my concern about what our schools and colleges were doing to educate our young people, and the public generally, to the tragedy of our deteriorating environment, and, more particularly, what the Office of Education was doing to encourage and promote efforts to educate for environmental improvement.

In order to have an answer to my question, I asked one of my young assistants, Mr. Logan Sallada, to chair a task force composed of staff members in the Office and to report to me on their findings.

And I find that Mr. Sallada represents not only the Office, but also the young people across our country who are interested in this subject. It is they who have brought to our attention, probably more than any other group, the current situation and the need for doing something about it.

As you might expect, the task force found the Office was supporting through its various funds a variety of programs, ranging from the most elementary forms of traditional conservation education to exciting new efforts in life and earth sciences.

Their survey showed that a major source of authority which provided support in the area of environment was title III of the Elementary and Secondary Education Act. Under this title more than $4 million has been devoted to conservation and outdoor education projects, including approximately 100 environmental and outdoor education centers.

As you know, Federal funds under title III are provided only for a period of 3 years; therefore, I was pleased to learn that a recent check of a sample of projects initiated with title III funds indicated that about half will be continued with State and local funds.

Another source is title I of the Higher Education Act. The Office had supported over $330,000 in projects which could reasonably be identified as making a contribution to a better understanding of our environment under this authority.

These included in fiscal year 1969, for example, grants to Bowdoin College to produce a film on community land use in Maine; to Boston Architectural Center for a study of environmental design in community planning; and to New Mexico State University for a citizens conference on water resources.

In addition to these programs, moneys provided from other Office of Education programs, such as teacher training, manpower development, curriculum development, and graduate study have included projects related to environmental education.

In an attempt to encourage the educational community throughout the Nation to assess its responsibilities in this vital area, I addressed the American Council of Learned Societies on January 23 on this topic.

In February I sent a special message to chief State school officers suggesting specific activities for the encouragement of environmental education which they might undertake at the State and local levels, including the development of comprehensive State plans.

I should like the privilege of inserting a copy of this message in the record at this point.

Mr. BRADEMAS. It will be made a part of the record.

(The document follows:)

DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE, OFFICE OF EDUCATION, WASHINGTON, D.C., FEBRUARY 17, 1970

Memorandum to Chief State School Officers.
Subject: Special Message on Environmental/Ecological Education.

As you are aware, the issues of the "quality of life" and our threatened environment have been a very important topic in recent weeks. Americans are becoming increasingly upset by the degradation of air, water and land resources. This concern has engendered citizen participation by students, teachers, businessmen, and housewives, all trying to impart a new consciousness of environmental problems and their solutions. Within this issue, the educational component has often been neglected. Yet, I am sure you agree it is one of great importance. We must attain an in-depth understanding of the need for balanced ecological systems within our environment.

In keeping with this concern, on January 23 I delivered the enclosed speech entitled "Education for Survival" which I hope you will find of interest.

Enclosed also are some ideas which have been suggested to me by the Office of Education's Environmental Education Studies Staff concerned with ways of integrating Environmental/Ecological Education into school curriculums. I look forward to receiving your thoughts on this vital issue and encourage your leadership in this area of critical importance to our country.

JAMES E. ALLEN, JR.,
Assistant Secretary for Education
and U.S. Commissioner of Education.

ENVIRONMENTAL/ECOLOGICAL INITIATIVES

I. POSSIBLE STEPS AT THE STATE LEVEL

A. Assessment, evaluation, and planning activities

1. Take inventory of Environmental Education resources that are or might be available to the schools. Environmental Education resources include curriculum and teaching materials; exemplary programs; physical facilities; teachers in the State school system who are knowledgeable about and/or interested in Environmental Education; and knowledgeable persons from industry, business, colleges and universities, private organizations, and public agencies other than schools.

2. Set up State conferences and workshops to (a) assess your State's Environmental Education resources and needs, determine the State's objectives, and plan actions which meet these objectives as well as the needs of localities; and (b) develop multidisciplinary or interdisciplinary Environmental Education curriculum including the natural and social sciences and making full use of the outdoor laboratory. The Environmental Education Studies Staff is assessing and compiling models and materials which may be useful in your curriculum planning efforts.

3. Contact community colleges and other State agencies that might be administering Environmental Education programs (vocational education programs, community service and continuing education programs) to assist in planning and implementation of activities.

4. Encourage colleges, universities, community colleges, and other education agencies to work with urban communities to identify the inner cities' special problems and needs and sponsor environmental education activities which focus on the problems of the inner city.

B. Education and information activities

1. Inform school administrators and teachers about Environmental Education. A reproduction of "Education for Survival", a copy of which is enclosed, might be useful as part of an information packet.

2. Plan for the participation of the State's elementary and secondary schools in the National Teach-In of April 22. The activities carried out on that day should serve as the catalyst for continued action. Your local teach-in headquarters can be contacted for additional information.

3. Hold regional and/or State seminars on Environmental Education. Begin the seminars this summer through regional teach-ins for teachers mentioned in my speech, such teach-ins attempt to accomplish three things: (a) provide teachers and curriculum supervisors with an understanding of the role of education in solving our environmental/ecological problems and of the natural relationships between education and ecology—a relationship too long ignored, (b) enable teachers and curriculum supervisors to examine at least one outdoor area and determine its use in supplementing classroom activities, and (c) help education personnel relate their discipline specialties to Environmental Education and understand the relationship of all disciplines to Environmental Education.

4. Establish State Environmental Education clearinghouses which would be utilized by schools and communities desiring to establish local clearinghouses.

II. POSSIBLE STEPS AT LOCAL SCHOOL LEVEL

A. Planning activities

1. Hold regional conferences, attended by State representatives, to identify the region's needs and resources.

2. Contact community colleges and other State agencies to assist in planning and implementing activities.

3. Design environmental education work-study projects for students with assistance from higher education institutions, business, industry, community colleges, and community organizations.

4. Assist community groups in urban areas to identify free spaces or land areas which could be acquired for environmental study purposes.

5. Determine how the school might serve as a nerve center for community action on EE.

6. Plan the effective use of school facilities for community EE projects—including seminars, adult education classes, and parent-student workshops.

B. Community/regional projects

1. Use community resources (libraries, universities, businesses), to set up Environmental Education book shelves, displays, information resource centers for community use.
2. Coordinate community education activities such as film and lecture series.
3. Plan and sponsor community-wide ecology-projects involving the Girl Scouts, 4–H, Lions Club, Rotary Clubs, J.C.'s, and other youth and adult groups.
4. Establish Ecology-teams to work with local governmental officials on special environmental projects.
5. Operate anti-pollution tours with traveling student Ecology-teams (age 25 and under) offering assistance to communities. Take children on field trips to show them how to combat pollution; the teams could also serve as Federal/State/local referral services for the region.

The Office of Education and the Department of Interior, along with other Federal agencies would provide technical assistance.

6. Arrange talks and lectures by students from nearby law, medical, and other professional schools on how environmental problems affect the individual and what individuals can do to help resolve these problems.
7. Organize drama, essay, film, photography, poetry, or poster contests to increase itnerest in and enthusiasm for improving our environment. Encourage local service organizations to sponsor such contests within the school and community—and handle the coordination of reginal or statewide competition.
8. Initiate "ecology-fairs" or happenings, incorporating contests judging as a major activity.

C. Anti-pollution actions

1. Set up requirements that all school buses and new school heating units purchased have anti-pollution devices. These might be arranged through contractual controls.
2. Investigate your school heating plants to be sure that fuel with low-content sulphur is used and exhaust-filtering devices are used.

Commissioner ALLEN. In response to these actions, we have received numerous letters, and, Mr. Chairman, I am told they run into the thousands, telephone calls, and visits from educators and local administrators expressing strong support of our position and interest in participating in activities planned by the Office.

I have been pleased to note how far some States, California, New Jersey, Pennsylvania, and South Carolina, for example, have gone on their own to develop State programs in environmental education.

The New Jersey plan calls for the establishment of a State advisory committee on environmental education to advise the State commissioner of education on the implementation of a statewide program; strengthening the network of State environmental education centers, they currently have four centers; and new legislation for the support of environmental education throughout the educational continuum.

South Carolina is probably farthest advanced in its efforts to develop a statewide curriculum. The State department of education, in cooperation with the University of South Carolina, has just completed a 6-year conservation curriculum improvement project. This project produced eight teachers' guides for grades 1 through 12, in science, social studies, home economics, and outdoor education.

A testing program has been set up to evaluate the effectiveness of the program.

Although we did not have much latitude with fiscal year 1970 funds, we have redirected monies wherever possible into projects in support of environmental education.

The research training program initiated a new effort to design innovative training program for educational researchers, developers, disseminators, and evaluators to work on high-priority educational programs.

We have sent out requests for proposals which encourage the design and implementation of training programs in a number of substantive areas, including environmental education.

We anticipate that a few such proposals will be funded in fiscal year 1970 and that others will be funded for operation in fiscal year 1971.

We are also negotiating with the Corporation for Public Broadcasting for the production of an important educational TV program in environmental education. Details of this project, into which we shall be putting over $2 million, will be announced soon.

We have set aside $200,000 of EPDA funds for the partial support of a number of teacher "teach-ins" this summer to be held around the country.

These teach-ins will be designed to encourage schools and school systems to include environmental studies in their curriculums for grades K through 12. The short-term objective would be to partially integrate this into existing subjects or to establish new courses.

Participants would include teachers, curriculum development specialists, administrators, and students.

The Office of Education plans to support costs for planning, materials, and consultants. State departments of education, local school districts, and other groups would provide participant support costs.

The Office of Education hopes to partially support approximately 40 local teach-ins and seven regional teach-ins.

We are sponsoring a major conference in August on the challenges of environmental ecological education to the schools of America.

The Office of Education and the Department of the Interior, through its National Park Service, are entering into a cooperative agreement to make optimal use of the cultural and natural resources available through the Department of the Interior's national environmental education landmark program.

We are beginning now to plan for our participation in the 1972 United Nations National Environmental Year.

Turning outside the Department of Health, Education, and Welfare, I would point out the contributions the National Science Foundation is making to environmental education under its broad authority to support research and education in the sciences. The Foundation is currently financing a broad range of activities in environmental education. Furthermore, with a focus in its fiscal year 1971 budget on problem-oriented activities, environmental programs will receive additional emphasis.

I would like to include as a part of my testimony at this point an enumeration of some of the specific National Science Foundation programs in this field.

(The programs mentioned above follow:)

NSF ACTIVITIES WHICH SUPPORT ENVIRONMENTAL EDUCATION

NSF has for a number of years directly and specifically supported education in the environmental sciences. The activities supported have included all types of science education activities and all levels of the education spectrum. The import of these grants has been both to upgrade the knowledge of those individuals who are following careers in teaching about our environment and to improve the quality of the materials of instruction used.

At the pre-college level an increasing emphasis has been placed on the improvement of the competence of teachers in this important area. In FY 1970, summer institutes provided for updating and upgrading the subject-matter knowledge of approximately 1,850 secondary school teachers in subject matter specifically pertaining to environmental quality; for example, of the 58 grants awarded for study in the biological sciences, over one-third were specifically related to the study of environmental quality.

Similarly, in the in-service institute program and the cooperative college-school science program, there has been a steady increase over the past 2–4 years in projects which are concerned with environmental studies. These programs are focused on specific regions or localities and the instructional programs are by design relevant to the particular local setting and existing problems. The central theme of 12 in-service *institutes to be conducted* this fall will be "Man and the Environment".

Still on the pre-college level, but with broadened applicability, the Course Content Improvement Program has a number of active grants which pertain to environmental quality. Two examples can be cited: Environmental Studies for Urban Use (American Geological Institute) and Atmospheric Pollution Study Group (State University of New York at Albany). A number of proposals are now under consideration which will explore new approaches to giving facts about our environment and the development of an understanding of the importance of man's correcting past mishandling of his environment and planning for preservation and control of our natural heritage.

This approach also is found in a number of projects for superior secondary school students which involve research and independent summer study at colleges and universities which supplement the offering generally available in high school science courses.

At the undergraduate level, institutes and short courses for college teachers, particularly in the subject matter fields of ecology and urban economics, provide instruction for college teachers primarily involved with the instruction of undergraduate science courses. The Undergraduate Research Participation program has for 12 years provided support for independent study and research for undergraduate majors in science. Grants in this program include studies of pesticides and their degradation in soil, phosphates, temperature-salinity tolerances, atmospheric pollution and estuarine processes.

An important outgrowth of the Undergraduate Research Participation program is the student initiated and managed research project which the Foundation has supported at the California Institute of Technology.

This project involved a number of students from several colleges and universities who designed and carried out a series of coordinated research projects on environmental problems. The success of this and similar efforts has resulted in a new program being established to support problem-oriented research training projects for students which will include particular attention to the impact of the social sciences in this area.

At the graduate level, support has ranged from the support of post-doctoral fellows and graduate fellowships and traineeships in study and research in the environmental sciences to special projects for advanced training in biological pest controls to seminars and field training to consider advanced ecological questions at the graduate and post-doctoral levels.

The Foundation, under its Public Understanding of Science program, has also supported projects to acquaint the public with the scientific aspects of problems associated with the preservation of environmental quality.

Commissioner **Allen**. To highlight my personal support for nationwide efforts in the environmental field, I shall be leaving this evening to participate in Earth Day activities at the University of Wisconsin.

My presence on that campus will, I hope, help symbolize the important role I see education playing in improving the environment.

Our current efforts, significant as they are, are but the start of what must be a prolonged and consistent drive to improve the world in which we live.

I believe there is much more we need to do to stimulate and assist the education institutions in the Nation to meet the challenge of educating for environmental quality and ecological balance.

In addition to the activities detailed above, we will seek additional funds in the fiscal year 1972 budget, where appropriate, for curriculum projects, experimental and demonstration projects, and other activities related to the encouragement of environmental ecological education for youth and adults.

We will also continue to urge that State and local educational leadership focus increased attention on this field.

We will continue to coordinate our resources with those of other Federal agencies to assure the greatest possible support of environmental education.

As mentioned above, we have already initiated a closer relationship with the Department of the Interior to carry out this coordination.

I am advised by my staff, Mr. Chairman, that we do not need additional authority to carry out the purposes of H.R. 14753.

The bill relies primarily on curriculum development as a tool for increasing public understanding, and understanding of the young people in our schools.

Where additional curriculum development is required, we believe that existing authority is sufficient under the Cooperative Research Act the EPDA to fund any such projects and to disseminate curricular materials.

Additionally, we have broad authority under section 303 of the Vocational Education Act of 1963 to provide both dissemination of materials to communications media and technical assistance to State agencies, local educational agencies and institutions of higher education seeking to establish programs in this area.

Also, as I have indicated, other agencies of the Federal Government, such as Interior and the National Science Foundation, have authority to conduct environmental education programs.

I am nevertheless grateful for the leadership this subcommittee has taken by the introduction of H.R. 14753 and for the attention you are focusing on the urgent need to encourage increased educational activities with respect to understanding the current plight of our environment and the need to educate for environmental quality and ecological balance.

Mr. Chairman, I thank you for this opportunity, and I will be glad to answer any questions you may pose.

Mr. BRADEMAS. Thank you very much, Mr. Secretary, for your statement.

I would like to state at the outset, because I think it is important that it be understood, that the bill before us today is one that enjoys bipartisan support, in that it was introduced by the distinguished ranking minority member of this subcommittee, the member from New York, Mr. Reid, and by Mr. Hansen of Idaho, who are here today, as well as the other gentleman from New York, Mr. Scheuer, and also myself, and, therefore, the support we have given by having introduced this bill should not be regarded as partisan in any sense.

As I indicated at the outset of these hearings this morning, by my having quoted from your address of January to the American Council of Learned Societies, which I thought was a splendid address, I have no questions in my own mind of your own personal commitments of the idea, and of the need for Federal support of environmental education, but I do have profound misgivings about the support given by the administration to efforts in this field.

I would also like to include in the record in addition to your own address, an address given by Secretary Finch on the 7th of February, before the National Association of Secondary School Principals, because I think it is a splendid address also.

(The address follows:)

[From the Congressional Record—House, Apr. 23, 1970]

ADDRESS BY THE HONORABLE ROBERT H. FINCH, SECRETARY OF HEALTH, EDUCATION, AND WELFARE, BEFORE THE NATIONAL ASSOCIATION OF SECONDARY SCHOOL PRINCIPALS

As my own first item of business, let me convey to you, at his personal request, President Nixon's greetings. Even though the press of business has prevented his personal attendance, he asked me to express his concern and close attention to your endeavors.

Your convention theme, "What's Right with American Education," provides a healthy concern with the positive. I don't think by that focus that you are ignoring the problems and tensions which secondary schools are experiencing. Since you are at the eye of the storm, you obviously know that there are no rugs big enough to have some of your problems swept under.

SPIRIT OF THE POSITIVE

It is in that same spirit of the positive that our own efforts are proceeding.

* * * * * * *

There is one final item on my agenda which I deem intimately related to all I have said this morning. By discussing it as an educational vehicle for the channeling of student energies. I do not mean it as a cynical technique of crisis management. I refer, of course, to the compelling problems of restoring the Nation's environment. This is not, and it cannot become, a political fad or a passing bit of heavy rhetoric. We mean business. Environmental considerations—a sense of responsibility for this planet and for each other—must become a permanent component of every decision—governmental, legal, industrial, and personal—from here on out.

ENVIRONMENTAL EDUCATION

The burning question about the degradation and abuse of the environment is no longer the catalogue of ecological horror stories, but rather: "What are we going to do about them?" And in this battle, there is no weapon more critical than education.

The teacher we intend to send into our public schools in 1980 is today a sixth grader somewhere in America. He or she must be taught—beginning right now—along with every American boy and girl, about environmental quality, about ecology and about all of the complex and interacting elements that go to make them up.

We and they must learn together—and in the spare time we have left, we must begin to write the textbooks for this new educational enterprise. We must think about America as it will be in 1980—a Nation with some 250 million citizens with different kinds of schools and different kinds of teaching and learning programs, and we must do this right now. That future teacher will enter college in 1976 and new textbooks will have to be written and published, courses mapped out and instructors trained in these new disciplines.

When we turn these brand-new teachers loose in 1980, they must know much more than any of us do right now about the problems involved in human survival—or else the war may well be lost, although the battles may go on for a few decades longer.

Departments devoted to the environmental science are being started at many of our Nation's universities. Many seminars have been held. This is an excellent

beginning—but we must also begin now to develop similarly oriented programs in our grade schools, in our high schools and in our junior colleges.

ADULT EDUCATION

These same basic courses must be developed and put into action at every stage of adult education. Logically, this should include not only adult education sponsored by formal school systems, but also the educational enterprieses conducted by business and industry, by unions and by other organized groups. The future of society lies in its ability to respond to crisis. And we are in a situation with regard to our environmental preservation that calls for a clear and vigorous response by every sector of American life.

THE ENVIRONMENT IS RIGHT HERE

We need in our schools to counteract the idea of environment as being something "out there" that can be visited and then left behind to the end of a field trip. Our goal must be to see that every school has access to an environmental study area where youngsters of all ages can grow up with the concept of environment as being everything that makes up their world, and with an understanding of the independency of all its numberless elements. Whatever Marshall McLuhan meant by telling us and the media that we live in a "global village," the analogous message for environmental education is clear: "The world is the classroom."

EEE

Through the development of what Dr. Allen has called EEE—environmental/ecological education—at every level of learning, I see some very exciting things:

Pre-schoolers will more and more be using the out-of-doors as a classroom—for it is urgent that our children early begin to understand their environment.

High school students will use civics courses to engage in work study programs with city and state officials and environmental quality professionals. They will focus on all sorts of urban problems to which solutions must be found—waste disposal, water supply, pollution and population.

Undergraduates will participate in multidisciplinary classes under the guidance of master teaching teams to allow them to work out the great intellectual synthesis of the 1970's—the still unexplored area that lies among the humanities, the natural and social sciences, and the broad-based environmental studies that must be undertaken.

FUSION OF EFFORT

Education in this issue is not just something for kids. The entire level of mass citizen understanding and participation must be raised if we are to reverse the environmental skid. In this effort, we must rely on educational television, on community colleges, on business, on labor—in fact, on a total fusion of individual and group effort.

Action on this issue calls for both skills and passion: for disciplined scientific techniques and the emotional commitment to utilize them. If our communications do not fail us in this crisis, ALL AMERICANS WILL, TO SOME DEGREE, BECOME ECO-ACTIVISTS.

DECADE OF CHALLENGE

Let me close my remarks on the note struck by your conference theme. If there were to be one crucial thing that is right among the many things that are right—about the American educational system, it would be its historic capacity to respond creatively to challenge. This is the decade of challenge; and in your constructive introspection, the response has already begun. To that I can only echo the words I quoted last spring at a White House meeting of the best of your own students—the Presidential Scholars. The words were uttered by my predecessor, John Gardner, and they apply to education, to political leaders, and to each one of us.

"A nation is never finished. You can't build it and leave it standing as the Pharoahs did the pyramids. It has to be recreated in each generation by believing, caring men and women. It is now our turn. If we don't believe or don't acre, nothing can save this nation. If we believe and care, nothing can stop us."

EDUCATION FOR SURVIVAL

(Address by James E. Allen, Jr., before 1970 annual meeting of the American Council of Learned Societies)

In the course of the past few weeks we have been treated to every conceivable kind of review of the 60's and prediction for the 70's that hindsight and foresight together could reduce to words.

One of the most troubling things we have learned from this inventory is that our world—which once we believed would endure for almost anyone's casual definition of "forever"—is in acute danger of becoming the subject of a premature obituary notice.

As President Nixon said in his State of the Union address yesterday, "The great question of the 70's is shall we surrender to our surroundings or shall we make our peace with nature and begin to make reparations for the damage we have done to our air, to our land, to our water."

SCOPE OF "EDUCATION"

If the tragic state of the environment seems a rather inappropriate subject for an address by the United States Commissioner of Education, let me assure you that it is not. Indeed, everything we have been alerted to about the perilous condition of our planet comes under the heading of "education."

Granted, it is an unusual form of education. Instead of learning it as a matter of course from our earliest classrooms on through the educational process, we are having it sledgehammered into our heads rudely and with little warning. It is education nonetheless, and in the light of history, it may prove to have been the most valuable we have ever been exposed to.

EDUCATION FOR SURVIVAL

Though this may seem at first to be education for catastrophe, it can also provide the catalyst for creating education for survival. For the human species, all of whom share a steadily worsening environment, there can be no more important consideration.

At the outset, let me say this: there is nothing whatever that is remotely political or even partisan in what I am saying to you tonight. The environmental deterioration in which we find ourselves knows neither Republican nor Democrat, white or black, rich or poor, young or old. To experience it, to suffer from it, to be concerned with it, to be committed to do something about it—all that is required is that you be alive. All else is quite literally irrelevant.

TECHNOLOGY OUT OF CONTROL

The plain fact is that the technology of living that we have created has gotten—we hope, only temporarily—out of control. Our mere existence is creating dangerous changes in the delicate balances by which we have thus far survived on earth. Our technology has so far been used primarily in ways which aggravate these changes. Only now are we learning how to measure the changes we know about—and to be wary of the subtle long-range changes of which we are not yet even aware.

I need not belabor you with statistics. You have read them, and heard them, and flinched at them and perhaps wearied of them.

Who, after all, can really visualize 142 million tons of pollutants discharged into the air of this country every year?

What does it really mean to say that $20 billion is the estimated cost of the havoc wrought annually by these pollutants?

Eight million junked automobiles, 26 billion discarded bottles and 48 billion cans, 150 million tons of solid wastes, 2,100 communities dumping billions of gallons of raw sewage into our waterways—these are statistics that boggle the mind, and they are repeated like clockwork every year, inching higher and higher toward the point that reads "human extermination." It takes something really different—like a river so filthy it actually catches fire—to engage our jaded attention.

We created this technology by exploiting our talent for invention, our dedication to learning, and willingness to work and work hard. Now we face the ultimate challenge of using these same national characteristics to regain control of our technology—lest uncontrolled it exterminates us.

The time we have to achieve this reversal may be no longer than the few years remaining in this century. In any event, there is no time to lose. *The key to human survival is education.*

WHY EDUCATION?

Why do I say that education is the key to survival? Why not new laws? Why not new rules and regulations and codes and all the rest of the complex apparatus of government which regulates nearly all human endeavor? Why is education more important than all of these admittedly important measures?

The answer is that in a free society it is always the citizen who must bear the ultimate responsibility for the choices that are made and the actions that are taken. In all our history we have found no better way than through the process of education for equipping citizens—you and me and our children—with the knowledge and the understanding needed to make these choices and to take these actions.

What we desperately need is not ingenious tinkering with the surface of our culture but a new vision of the possibilities of human life in our age. To whom should we turn for such a vision, and who can persuade our citizens to pay the price for carrying it to fruition?

Not so long ago, many people were confident that science could solve such problems, but such confidence is no longer as pervasive as it used to be. The scientists themselves are frequently known to express pessimism. All of the threats to human existence ironically derive, to a greater or lesser degree, from the extraordinary flowering of science-based technology in the twentieth century. That this flowering has brought many benefits to man, few will deny. That it also extends his power beyond his demonstrated wisdom to use it to his collective advantage is also hard to deny. There is growing conviction in this country that science is now too portent-laden to be left to scientists alone. In this regard, I am reminded of the prophetic words of Lord Snow in his book, *Two Cultures*, some years back.

It is at this point—at the last millisecond before midnight—that the humanism and social scientist are being invited to help salvage our society. It is ironic because, like Churchill under the clock in Parliament thundering unheeded warnings of disaster prior to World War II, the social scholars have long predicted the state of affairs to which we have come. Yet like Churchill, they must now assume a major responsibility for averting the impending doom.

PRIMACY OF CULTURE

There is only one way to do so, and that is to reassert the primacy of a man-centered culture which subordinates technology to the human condition. That is what the new national environment policy is really all about—a Renaissance of Man in the decade of the 70's.

This Renaissance takes as its paramount issue the quality of life. And who is better equipped to speak on the quality of human existence than the man of humane letters and social concerns? Who else has devoted his life to the most productive and liberating ways of approaching the human condition? I charge each of you with the burden of leadership, of speaking to the creation of exemplary men.

In this regard, I cite Classics Professor William Arrowsmith of the University of Texas whose views on education should constitute a statement of goals for us all:

"It is men we need now, not programs. It is possible for a student to go from kindergarten to graduate school without ever encountering a *man*—a man who might for the first time give him the only profound motivation for learning, the hope of becoming a better man. Since the humanities aim at humanization, their meaning and end are always, I believe, an exemplary man. Hence the humanities stand or fall according to the human size of the man who professes them."

It is clear, then, that scientists are not alone responsible for the woes of our civilization. Humanists and social scientists by their indifference must share with other citizens some responsibility for the current state of our world too. But the times are now suddenly ripe for a fruitful intercourse between the humanities and the sciences. The surge in inter-disciplinary team research and study represented by the concern for ecology constitutes a major opportunity for an impact upon public policy by the humanities and social sciences.

A major thrust will be made through the agency of education. I hope that you will not neglect the challenge presented to you to participate in the reorientation of American education toward man-centered environmental study. The newly awakened social conscience in our country demands a response by educational authorities. We ask that you join us in shaping an educational policy consonant with that Renaissance.

RESPONSIBILITIES OF GOVERNMENT

The responsibility of the government is to lead.

That is why the President, on January 1, 1970, marked the start of a new decade by signing the bill establishing a Council of Environmental Advisors. It is why he said, "The 1970's absolutely must be the years when America pays its debt to the past by reclaiming the purity of its air, its waters and our living environment. It is literally now or never." It is why he has dedicated this Administration to the saving of our fragile, threatened environment—on which our survival depends.

It is also the responsibility of government to set an example—to encourage the growth of public understanding of its activities, of public concern, of public participation. "Until he has been part of a cause larger than himself, no man is truly whole," the President said in his inaugural address.

Above all, it is the responsibility of all government—not just national or state, but every local unit that operates a public school system—to educate . . . to replace confusion with knowledge . . . to replace concern with commitment and action.

It is at this point that the humanists and the social scientists should be "doing their thing." The problems we have are not just scientific. They are social and they bear directly upon human interaction with the total environment. What we need desperately from the cognoscenti such as you here tonight is help in posing the right questions. If the growing surge of citizen concern is to give rise to new human survival techniques and attitudes, a leadership role for the humanities is essential.

Learning about environment and ecology and all that affect it is admittedly complicated. Even today, when we know how dangerously threatened our environment is, we have only a small corps of qualified professionals to call upon. But if government at any level should take the attitude that this is all too complicated for the average citizen to understand—that he is needed merely to pick up the bill—then we shall be inviting public apathy, and even the most ambitious programs will eventually fail.

We simply cannot afford failure.

TWO GENERATIONS

We must therefore begin immediately to use our full educational capability to learn as much as we can, as fast as we can, about how to save our environment. At the same time, we must begin to teach not just one but two generations of Americans, simultaneously, all that they must know in order to revive the earth on which we live.

Why do I say two generations? Simply because you and I and every other adult American must learn all this, just as must every American whose age puts him in the student population. We must learn it so we can understand it—and we must learn it in order to be able to teach it on a vastly greater scale than anything we have so far envisoned.

The teacher we intend to send into our public schools in 1980 is today a sixth grader somewhere in America. He or she must be taught—beginning right now—along with every American boy and girl, about environmental quality, about ecology and about all of the complex and interacting elements that go to make them up.

We and they must learn together—and in the spare time we have left, we must begin to write the textbooks for this new educational enterprise. We must think about America as it will be in 1980—a nation with some 235 million citizens with different kinds of schools and different kinds of teaching and learning programs, and we must do this right now. That future teacher will enter college in 1976 and textbooks will have to have been written and published, courses mapped out and instructors trained in these new disciplines.

When we turn these brand-new teachers loose in 1980, they had better know much more than any of us do right now about the problems involved in human survival—or else the war may well be lost, although the battles may go on for a few decades longer.

What are the specific tasks to be assigned to this new environmental/ecological education? They can be summed up briefly: *awareness, concern, motivation and training:*

Awareness of how we and our technology affect and are affected by our environment;

Concern for man's new and unique responsibility to re-establish and to create beneficially balanced relationships among all forms of life within the closed earth system;

Motivation and training to enable us to acquire and spread the knowledge and skills that will help us solve interrelated environmental problems and prevent their future occurrence.

The end product of this kind of education—and it must take place at every level of the educational enterprise—will be to create, within the decade that has just begun, a citizenry with a clear understanding that man is an inseparable *part* of the system and that, as such, his continued existence is totally dependent on its continued functioning.

ALL EDUCATIONAL LEVELS

Departments devoted to the environmental sciences are being started at many of our nation's universities. This is an excellent beginning—but we must also begin now to develop similarly oriented programs in our grade schools, in our high schools and in our junior colleges. It is essential for students reaching the university level—and just as urgent for those whose education will not take them that far—that they already know the basic facts about environment just as you and I learned addition and subtraction.

These same basic courses must be developed and put into action at every stage of adult education. Logically, this should include not only adult education sponsored by formal school systems, but also the educational enterprises conducted by business and industry, by unions and by other organized groups. The future of society lies in its ability to react and respond to situations and events—and we are in a situation with regard to our environmental preservation that calls for a clear and vigorous response by every sector of American life. Eventually, as we gain ground, we should become able to *act* rather than merely *react*.

It is a matter of urgent necessity that we develop in both young and old an understanding of the society in which they live—an increasingly urbanized society with all the problems that this creates. We need to develop ecological studies designed to make everyone aware of the fragile and interacting relationships of land, air and water—and to give new understandings of the eco-concepts—that must govern the development of society, encompassing the demands of increasing urbanization.

We need in our schools to counteract the idea of environment as being something "out there" that can be visited and then left behind at the end of the field trip. Our goal must be to see that every school has access to an environmental study area where youngsters of all ages can grow up with the concept of environment as being everything that makes up their world, and with an understanding of the interdependency of all its numberless elements.

EEE

Through the development of EEE—environmental/ecological education—at every level of learning, I see some very exciting things:

Pre-schoolers will be using the out-of-doors as a classroom—for it is a matter of urgent necessity that our children early begin to understand their environment.

High school students will use civics courses to engage in work-study programs with city planners and environmental quality professionals. They will focus on all sorts of urban problems to which solutions must be found—waste disposal, water supply, pollution and population.

Undergraduates will participate in multi-disciplinary classes under the guidance of master teaching teams to allow them to work out the great intellectual synthesis of the 1970's—the newly emerging coalescence of the humanities, the natural and social sciences, and the broad-based environmental studies that are being undertaken.

Graduate students will work in special study programs directed to creating new and different approaches to solving ecological problems.

Teachers will be given opportunities to acquire the knowledge and the methods of teaching EEE.

Out-of-school adults will learn to understand how and why the ecology and the environment interact; and while the professionals and the para-professionals work toward finding the immediate solutions we *must* have, all of us will acquire the kind of knowledge we can no longer do without. The entire level of mass citizen understanding and participation must be raised if we are to reverse the environmental skid. In this effort, we must rely on educational television, on community colleges, on business, on labor—in fact, on a total fusion of individual and group effort.

ECO-ACTIVISTS

If our communications do not fail us in this crisis, all Americans will, to some degree, become eco-activists.

Let me illustrate what this can mean.

In California, voters in San Bernardino County recently turned down a proposed coal burning plant despite the increased tax revenues it would have contributed. Residents in a Seattle suburb chose to preserve a wooded park area instead of clearing it for a golf course.

A recent example of the effectiveness of the working meld provided by mass communications, citizen response, and various levels of government working in partnership was the halting of the Everglades Jetport. An irreversible ecological tragedy was averted and we lighted a beacon of hope and inspiration for a nation of environmental underachievers.

The decisions to be made by each of us in the future will be on both small and very large environmental issues, but, whatever their degree, they will be more and more numerous in the years ahead. It is vital that we and our children be equipped with the wisdom and understanding that reject haphazard or emotional choices in favor of informed, reasoned decisions.

Undertaking this vast new educational enterprise will have far reaching and highly beneficial implications for American education. It will be a catalyst whose impact will register in every classroom and, I hope, in every home and office and plant in America.

Scholarship will benefit by the development of the essential inter and cross disciplinary studies that will be needed. The active involvement of our educational system in problems that pervade the lives of all will help to make the educational process more relevant and responsive.

This new emphasis in American education will help to make every individual more aware of how dependent each of us is upon the other. We shall—we *must*—learn that in the highly complex structure which is human society, survival depends on self-control (which includes control of technology—that mammoth extension of "self.")

The simple goal of all this educational effort is the realization that the acts of one react on all. If we can learn this lesson, we shall live in a better society. If we do not learn it, we may well have no society at all.

OFFICE OF EDUCATION

What is the Office of Education going to do to help American education implement the environmental challenge outlined by the President and alluded to here today? A number of things:

Promote EEE as a major activity of the Office in the 1970's.

Set up a special environmental studies staff to coordinate existing programs, redirect existing resources, and plan new programs and activities. This can be done by drawing creatively on all the relevant resources in O.E., without creating another bureaucratic unit.

Support appropriate legislation for Federal initiatives in environmental education.

Call a major conference in June on the challenge of EEE to the American educational community.

Support wholeheartedly the Environmental Teach-In scheduled nationally for April 22. I urge all American educators, at elementary, secondary and higher levels throughout the nation, to concern themselves with this effort and to give this environmental event the impact it deserves.

Propose that teachers follow up the National Teach-In by organizing and planning regional *Ecological Environmental Teach-Ins for Teachers* in the Summer of 1970. The Office of Education and the Department of Interior would assist these efforts in cooperation with State and local groups and organizations.

Cooperate with the Department of Interior to put to the highest educational use the cultural and natural environmental resources of the National Park Service. The Department of Interior's National Environmental Education Landmark program represents a major step in the direction that education for survival must take.

And finally, begin to plan for our participation in the 1972 UN International Environmental Year. Since we are the leading industrial nation, we must take leadership in countering industrial violence to the environment. The spread of our industrial technology has brought with it the spread of its rot. As John Gardner recently said: "The problem of nuclear warfare, of population, or the environment are impending planetary disasters. We are in trouble as a species."

CHALLENGE AND RESPONSE

Before us stands a great challenge. Arnold Toynbee has told us that the essence of the story of mankind and the survival of civilizations is to be found in the cycle of challenge and response. Those that respond survive; those that do not decline and die.

I believe America contains the seeds of response. Some are disturbed by the enormity of the challenge—but the very fact that we are willing and anxious to focus on our environmental problems is the best assurance that we do indeed still possess the energy to tackle them and the ability to forge the tools to conquer them.

In just six years, this nation will enter upon its third century of independence. How our children and their children will live in that century—or even if they will—is almost totally dependent on the commitment we must now make and the dedication with which we carry it out.

If we are committed and steadfast, then we can in good time step aside and make room for the future, with the reassurance that we have kept the faith . . . that in the brief but eloquent words of Ecclesiastes:

"One generation passeth away and another generation cometh, but the Earth abideth forever."

Mr. BRADEMAS. In that address Mr. Finch went on to say that there is an excellent beginning, but we must also now begin to disseminate or to discuss similarly oriented programs. The Secretary has given a good summary of the bill, which the administration is unwilling to suport, but I want to suggest it is a cause of great distress to me to see once again in the field of much needed education legislation, it appears all we are getting from the administration is rhetoric, high-sounding prose, but no action, and no flesh at all on the bones of the contention that we mean business.

They mean business all right. They mean business for the Bureau of the Budget, but no business for the urgent need of education.

Now, I think it is particular distressing on the eve of Earth Day, that the officials of this Government, who have primary responsibility for policy in education, should not find it possible to be able to come to this subcommittee and tell us after all of these wonderful speeches that this administration is indeed willing to give its support to a modest proposal, very modest proposal to provide support for environmental education, just to give us that.

To give you some idea, I think it ought to be on the public record, the lack of responsibility on the part of the administration in this field.

Let me tell you some of the experiences we had in this subcommittee.

I personally invited Russell Train, the distinguished member of the Department of the Interior, to testify on this bill, and he declined, although I should have thought that someone in that position might have had some passing interest of what we are up to in this respect.

After he declined, he sent his White House fellow up here to be briefed on the bill, and the White House fellow left, stated he was enthusiastic about the bill, thought it was a good idea, and then the Department of the Interior called us.

We did not call them, and they asked to be scheduled to testify on this bill, and, indeed, the Undersecretary was scheduled to testify, but at 4 o'clock yesterday afternoon, we received a phone call saying no one would testify, and no explanation was given, and yet I have before me, Mr. Secretary, a letter dated January 21, 1970, signed by the Deputy Assistant of the Department of the Interior stating he hoped the bill would be enacted soon, and I submit this for the record.

(The letter mentioned above follows:)

U.S. DEPARTMENT OF THE INTERIOR,
Washington, D.C., January 21, 1970.

HON. JOHN BRADEMAS,
House of Representatives, Washington, D.C.

DEAR MR. BRADEMAS: I have noted with great interest that you have recently introduced a bill supporting environmental education. As a former Dean of Environmental Sciences at the University of Miami, I happen to believe that this is a most important bill, and I hope it will be enacted soon. I would appreciate receiving a copy of your bill and am enclosing, for your information, a recent paper of mine on the subject, presented at the December meeting of the American Association for the Advancement of Science. I would be happy to supply any additional information or papers you may desire.

Sincerely yours,

S. FRED SINGER,
Deputy Assistant Secretary.

Mr. BRADEMAS. Now, apparently the Budget Bureau had not gotten to this gentleman, and he found himself awash in the flows of Washigton, D.C., and because it reminds me of the situation in which my good friend, also, Libby Coots found herself when she came up and testified in favor of the Brademas, Reid, Scheuer, Hansen education program, only to be advised later on, wait a minute, you are not supposed to be going up there and telling them, telling those fellows, that you are really for those bills.

Even if you are, you have got to clear those things with the Budget Bureau, because obviously they know a lot more about education than you authorities and you in education.

I call also your attention to the fact that although your counselors tell you, that to quote your statement, that "The bill relies primarily on curriculum development as a tool for increasing public understanding." I don't know who your counselors are, Mr. Secretary, but they have not read this bill, because if you take a look at the bill, you will see that there is a series of measures that the bill contains of which curriculum development is but one.

Now I think we invited you to testify a couple of months ago, and there might have been opportunity during that period of time for somebody in your Office of Education to read the bill before coming up here and making a statement like that.

I also call your attention to a report of the Citizens Advisory Committee on Environmental Quality, chaired by Lawrence S. Rockefeller, whom as you know has been long established as a man with deep concern about the out-of-doors in particular, and I call your attention to the passage in that report dated August 1969 which I should have thought members of your staff would have brought to your attention on the subject of environmental education, and I think you will find that what the report of this distinguished advisory committee says about the state of title III of Elementary and Secondary Education Act, that it is completely out of line with what your testimony has said to us here today, and you note on page 2 of your statement that a survey showed that a major source of authority which provided support in the area of environment was title III of the Elementary and Secondary Education Act.

I don't think that is an accurate statement. If you will look at page 13 of the Rockefeller Report of August 1969, you will note, and I quote:

> With respect to Title III of ESEA, which they indicate enable the establishment of over one-hundred environmental education centers, no program was initiated to disseminate to the rest of the nation's teachers, the teaching methods and curriculum materials developed at these centers.

They go on to point out in this document some profound reservations about leaning on title III, ESEA, a major source of authority for environmental education.

They say, and again I quote from the Rockefeller report:

> Today, after speaking of Title III programs, today, after nearly four years of experience, there is no source that can tell one what specifically has been produced in these Title III projects, what specific curriculum material or teaching techniques are worth preserving, no report on which environmental projects have been successful.

And why not?

They go on to warn that with respect to the act which Congress took to give title III responsibility, to take away from the Office of Education, and to put it in the hands of the 50 States, that this also is going to compound the difficulty of using title III.

They make similar complaints about the title I of the Higher Education Act, which is the continuing education program, noting that few programs under title I of Higher Education Act of 1965, have been designed for the needs of central city residents.

I could go on, Mr. Secretary, but I have hit you pretty hard, and I ought to give you an opportunity to respond to some of these concerns.

I will further supplement my criticisms by saying that it is significant that this is all on the eve of the "teach-in."

Commissioner **Allen**. Well, I think, Mr. Chairman, that your comments about our statement that no additional authority is needed, and, therefore, this bill is not necessary in order to do something, is wrong, because whether we have this legislation or not, we are in a position and plan indeed to take advantage of the existing legislation. We have to move ahead in the environmental education field.

Our problem is a budgetary one, not lack of authority. Title III and other titles in the various legislation that we administer give us broad authority to encourage and stimulate the educational community in the country to devote their funds to environmental projects, and we intend to do so.

As a matter of fact, I will submit for the record a collection of the projects that are carried out under title III that are related to environmental education, and I think they will be an impressive one.

Mr. **Brademas**. Who made that judgment, that they are impressive, Mr. Secretary?

We have been told precisely the opposite, that they are not at all impressive, and that they are being phased out.

I have been told a little about the attitude toward their effectiveness. In other words, all of the experts tell us exactly the reverse. The experts on environmental education have not come in here singing the praises of title III projects.

Where does that judgment come in?

Commissioner ALLEN. Well, let me submit my evaluation of that for the record, and then you can decide whether they are impressive or not.

Mr. BRADEMAS. Please do so.

(The document follows:)

One of the needs initially identified by the OE task force was that of evaluating ESEA title III and other environment-related projects supported by the Office. Several alternatives for meeting this need have been considered and plans are now underway for a formal evaluation of all ESEA title III outdoor, conservation, and environmental education projects. The evaluation will include the identification and dissemination of materials considered by consultants to be worthwhile within the context of environmentally/ecological education.

ESEA TITLE III PROJECTS, FISCAL YEAR 1968

[Results of a survey of 37 projects]

State and project title	Currently supported with State and/or local funds	Will continue with State and/or local funds fiscal year 1971	Currently seeking State and/or local funds	No longer in existence
Alabama:				
1. Selma City Public Schools				
California:				
2. Central California Laboratory for Learning: Extension				
3. Conservation, recreation, and outdoor science school				
4. NAPA experimental forest [1]				×
5. Environmental approach to investigations in science				
6. Earth science flying classroom				
Colorado:				
7. Cooperative summer school camp [1]			×	
8. "Dare to Care" [1]		×		
Connecticut:				
9. Talcott Mountain Science Center [1]		×		
10. Outdoor projects in educational services [1]				×
11. Project Outdoors				
12. RESCUE				
Delaware:				
13. Outdoor laboratory [1]	×	×		
14. Outdoor nature study center				
Florida:				
15. Sarasota County educational enrichment centers				
16. Resource-use outdoor educational center [1]				×
17. Escarosa Nature Center and Museum				
18. 3 Rivers Activities Center for Education				
19. Escambia Santa Rosa Humanities Curriculum Center				
Georgia:				
20. Fernbank Science Center [1]	×	×		
Idaho:				
21. Program of outdoor education [1]		×		
22. Program of outdoor education for entering 7th grade pupils		×		
23. Cataloging the natural resources of Idaho [1]				×
24. Program of outdoor education, a cultural and educational summer program for 7th grade pupils		×		
25. Summer outdoor education				
26. Outward Bound				
Indiana:				
27. Deep River Outdoor Center				
Illinois:				
28. Cooperative outdoor educational project [1]		×		
29. A school community outdoor educational project [1]		×		
30. Natural resources educational demonstration center [1]			×	
31. Application of the development, operation, and maintenance of a demonstration farm-outdoor educational center [1]				×

See footnote at end of table.

ESEA TITLE III PROJECTS, FISCAL YEAR 1969—Continued

[Results of a survey of 37 projects]

State and project title	Currently supported with State and/or local funds	Will continue with State and/or local funds fiscal year 1971	Currently seeking State and/or local funds	No longer in existence
Kansas:				
32. Seaman outdoor education project [1]			X	
33. Outdoor educational program				
Kentucky:				
34. Outdoor educational project, West Kentucky, ESEA, title III [1]		X		
Louisiana:				
35. Outdoor educational center				
36. Center for environmental studies				
Maine:				
37. Regional academic marine program [1]		X		
38. Outdoor laboratory natural environmental science [1]		X		
39. Planning a pace setting course in oceanography				
Maryland:				
40. Out-of-doors, a summer science program for elementary and secondary school students				
41. Indoor-outdoor science center				
Massachusetts:				
42. Oceanographic educational center				
43. Project Lighthouse [1]		X		
44. Lowell Environmental Arts and Science Center [1]		X		
45. Educational project to implement conservation (EPIC)				
Michigan:				
46. Exploring nature's classroom				
47. Outdoor education laboratory				
48. A program to modify concepts held by low-achieving students				
49. Integrating outdoor education with a flexible academic vocational curriculum				
50. Outdoor educational laboratory				
Minnesota:				
51. Environmental science center				
Missouri:				
52. Ourdoor natural science laboratory				
53. Biological and soil conservation laboratory				
54. Ourdoor laboratory in field ecology and establishment of an ecological museum				
55. Outdoor biological, soil, and water laboratory				
Montana:				
56. Summer institute in field ecology and geology				
57. Proposal to establish and maintain a wildlife study area				
58. Project SEE				
New Jersey:				
59. Union County Outdoor Education Center [1]	X	X		
60. Stepping Stone Environmental Education Center [1]			X	
61. The Conservation and Environmental Science Center for Southern New Jersey				
62. Science interpretive program [1]	X		X	
63. Outdoor conservation education center [1]	X	X		
64. New Jersey State Council for Environmental Education				
65. A classroom of today's world [1]		X		
66. Trenton Action Board's School Within a School [1]	X			
New York:				
67. Outdoor and conservation education project [1]		X		
68. Regional approach on conservation in education (RACE)				
69. Mid-Hudson Regional Supplementary Education Center; (PINE)				
70. SCOPE-SEC				
Ohio:				
71. PLEASE				
72. Mohican School in the Out of Doors				
73. Tridistrict and cooperative outdoor education				
74. Resident outdoor education				
75. Diversified outdoor education				
76. Marine information program				
77. Development of a marine science center				
78. Junior explorers learning				
79. M. G. multisensory approach to outdoor education				
80. Humanities program				
81. M. G. Hillsdale outdoor classroom development and utilization program				
82. Indoor-outdoor education recreational planning program				
New Mexico:				
83. Outdoor education center				

See footnote at end of table.

ESEA TITLE III PROJECTS, FISCAL YEAR 1968—Continued

[Results of a survey of 37 projects]

State and project title	Currently supported with State and/or local funds	Will continue with State and/or local funds fiscal year 1971	Currently seeking State and/or local funds	No longer in existence
North Carolina:				
84. Development of a marine science center				
85. Marine information program				
86. Diversified outdoor education				
Oregon:				
87. Regional outdoor education				
Pennsylvania:				
88. Central Pennsylvania outdoor education project				
89. SCORE				
90. NATUREALM				
91. Southeastern Pennsylvania outdoor education center				
92. Project [illegible] [1]			×	
93. Science center				
Rhode Island:				
94. Earth				
95. Project Earth				
Tennessee:				
96. Outdoor science laboratory program				
Utah:				
97. An outdoor education curriculum for all seasons				
Texas:				
98. Texas Gulf Coast Science Educational Resource Center [1]	×	×		
Vermont:				
99. Rutland nature area development				
Virginia:				
100. SCOPE				
101. Revitalizing learning through ecology K-12				
102. Summer camp for mentally retarded children				
West Virginia:				
103. W.G. outdoor educational conference and service complex				
104. Outdoor educational conference and service project				
Washington:				
105. An interdisciplinary outdoor educational program [1]	×	×		
106. Educational Cooperation Bicounty Service Co				
Wisconsin:				
107. Cooperative work-learn conservation and resource-use program				
108. Outdoor education for handicapped children				
Wyoming:				
109. Western Wyoming heritage—culturally, educationally, recreationally				
110. Conservation center of creative learning				

[1] Project included in survey.

Commissioner ALLEN. I think the significant point is that things are being done, and I hope as a result of our exortations to the states that more will be done in this regard.

I would only emphasize again, that I intend, as the Commissioner of Education, to carry out the promises as I have indicated in these messages, to see to it that all of the resources that can be used to encourage and help the States and localities and institutions of higher education to revise their curriculums and center on environmental projects will be brought to bear, regardless of whether the authority is granted by this bill or not.

I think the fine thing that is expressed in this bill is an indication of the bipartisan support and strong support of the Congress in seeing to it that education does play its role in this regard, but I just reiterate it is our feeling that we have the authority within the existing legislation to move forward.

Mr. BRADEMAS. I am interested in the statement that you have the authority, because the analog we had with the administration with respect to the drug abuse education bill is of course quite telling.

I remember that the administration witness came up here, and he opposed the drug abuse education bill, which was designed to do in the drug field as this environmental bill is designed to do in this field. The administration witness said they did not want this bill, because they already had the authority to do these things, and he asked how much money they were putting into it.

Mr. MEEDS. I think about $600,000.

Mr. BRADEMAS. Well, we passed that bill over the objections of the administration, 294 to 0, which I hope sets a precedent for the environmental education bill.

Commissioner ALLEN. I might point out we have added some $3 million to our EPDA funds since this bill was considered.

Mr. MEEDS. Will the Chairman yield.

Mr. BRADEMAS. I yield.

Mr. MEEDS. Your statement on page 4 says, "Although we did not have much latitude with fiscal year 1970 funds, we have redirected moneys wherever possible into projects in support of environmental education."

I hope this does not set a precedent, or I hope what you do in the drug abuse educational field does not set a precedent of what you do in the environmental education field.

Now, some of the programs which the Office of Education cut back were programs which I think were essential, so if you are going out and stealing more money from other programs to put in an environmental education program, it seems to me we have gotten nowhere.

Commissioner ALLEN. These matters of reading, drug abuse, all have very high priority, and it is a constant question of how you take the limited amount of money you have, to see to it that this money is spent to achieve the most good in these various priorities.

It is a difficult problem to get money out of a very tight budget, but I am saying to you that I don't intend to take money away from other important things if it will be harmful to those things; but there are always ways in which we can stimulate, through the research program and through other projects that we administer, increased attention to the educational process.

I am promising to see that is done.

Mr. MEEDS. Of course, the key word here, the teaching of teachers on teaching reading is very important, as I am sure you also feel.

I also consider drug abuse education very important, and if the administration had accepted our bill, they would have authorized, I think we could have gotten the appropriation, so you did not have to steal from the EPDA. I use that word steal very advisedly.

Mr. BRADEMAS. I think it is a matter of choosing to put the money into these important programs, and the country will be a lot better off.

I have more questions, but Mr. Reid has to go to another meeting.

Mr. REID. Thank you, Mr. Chairman, and Mr. Secretary. I want to welcome you here this morning, and to thank you for your thoughtful testimony.

I was particularly happy to hear that you are leaving today to participate in Earth Day activities at the University of Wisconsin as a part of your personal support for the nation-wide effort, and I am sure this will help to give impact to it.

I am also leaving to give impact to the Earth Day activities, and I am sure you will emphasize the importance you attach to this, and indeed the administration attaches to Earth Day, and the major problems to the environment.

I think the record should also show that President Nixon has taken a very large and important initiative to focus national attention on reclaiming the environment.

I am one of those who would like to see much greater resources put back of that commitment, but I think it would be unfair not to say that the administration has broken new ground, and it is in that spirit that I would like to have a brief colloquy.

First, though, Mr. Secretary, on page 3 of the bill, the purposes strike me as being somewhat broader than some of the initial testimony.

The bill says:

> (2) Undertaking directly or through contract or other arrangements with institutions of higher education or other public or private agencies, institutions, or organizations evaluations of the effectiveness of curriculums tested in use in elementary, secondary, college, and adult education programs involved in pilot projects described in paragraph 1(b).
>
> (3) Making grants to institutions of higher education, local educational agencies, and other public or private organizations to provide preservice and inservice training programs on environmental quality and ecology (including courses of study, symposiums, and workshops, institutes, seminars, conferences) for teachers, other educational personnel, public service personnel, and community, business and industrial leaders and employees, and governmental employees at State, Federal, and local levels.

This enumerated list here, I think is broader than your testimony.

I think the thought in back of the bill is to develop a coherent effort at the Federal level that will be supportive in regard to educational efforts across the board, not just elementary schools, but through adult education, and to deal with effective testing and dissemination of materials that is relevant. I too have talked with Russell Train, who is doing an outstanding job in this area, but one of the things they have found is that there has been very little coherence, and he is just beginning with the statements from the departments to even identify responsibility of the different departments in this area, and the things they are doing concerning the environment.

Accordingly, I will ask you first, do we not need an overall coherent program in this area, because, so far as I know, no one is pulling all elements of the environment together as it relates to education, and further as the Chairman has pointed out, so far as I know, there has been no pulling together with regard to title III of the efforts that we have. We have had testimony saying nothing as yet has been published, and it is plain that so far it has not been coordinated, and in some cases it has been only evaluated.

Commissioner ALLEN. Let me say that in the four or five paragraphs you read in the bill, the word curriculum or courses of study is in every one of them, so it certainly cannot be said that this is not a major or central part of this bill.

While I recognize that the bill has a very broad approach, certainly the production of good materials, training teachers in the use of these materials, and evaluating these materials are a central part of the bill's approach. I do not believe that I could be wrong in saying that.

I would also say that I am sure it is the intention of the Environmental Quality Council to provide this coherent and coordinated program that we need from Government in this area. I am sure it will be done, and I am sure that it is the intention of Mr. Train and the counsel to do so.

He has called upon us in my Office to play this role in respect to education, to coordinate the educational aspects on the environment, which we are planning to do. I think that the steps we are taking, and the plans already underway, are very consistent with the purposes of this bill.

Mr. **Reid**. Relative, Mr. Secretary, to title III, has anybody assessed that, evaluated it as to the work that has been done?

Commissioner **Allen**. This is now being done by our task force that I spoke of, and I will submit to you a report of that evaluation.

Mr. **Reid**. But there have been priorities to the dissemination of that to date?

Commissioner **Allen**. No, not to my knowledge, there has not been.

Mr. **Reid**. So I think one of the purposes of the bill is to get a sense of urgency in this field, as well as coherence, which do not now fully exist.

Mr. Secretary, I think that the bill is needed, and I think there is clear support from around the country, and there is a broad interest in it. In my own judgment, a quiet talk with the White House, a little encouragement of the Bureau of the Budget would be helpful. It seems to me the bill is on all fours with the President's efforts to do something for the environment. Consistent with your leadership, this is a piece of legislation that will give you an overall planning authority in this area, and it would be extremely relevant.

We would appreciate your submitting that report.

Let me state further, I do not believe the administration does not want to do a great deal, and to that extent, we should try to remove the budgetary roadblock. Philosophically, I cannot find very much difference between the approach to this bill, and what I believe and hope is the approach to the administration. Their assessment seems to be in accordance with this.

Commissioner **Allen**. Yes, and as I indicated, I recognize that this bill is a strong bipartisan expression of the Congress concerning an interest in seeing to it that the education system is, and that education programs are, focused in this area. I am sure that I speak for the administration, and certainly I speak for myself, in saying that I appreciate this approach to the backing that the Congress is providing.

All I am saying is that, based on the information I have and on the reviews we have made of existing legislation, we do not find any need for further authority to move ahead in this field.

Frankly, if I find that we do need authority at any moment, I will insist that we come back to the Congress with an appropriate request.

Mr. **Reid**. Well, I appreciate the pertinence of that remark in the spirit that it is given, but I must also say it is a rather traditional remark heard around here from time to time in years past.

The fact is that everybody thinks they have the authority but nothing much gets done, and given the way programs do seem to get launched, there is a need for this coherent bill, and major funding back of it, and agreement from the White House. I believe that it is necessary to do something in a major way, and I think it would be very useful to pursue this with your help, and I will endeavor to have a few quiet conversations.

Commissioner Allen. Any help you can provide on the major funding back of it will be very important.

Mr. Reid. We will try to work on the funding of the bill.

Mr. Meeds. I would like to apologize to the Commissioner for my earlier outburst.

As you can see, I am a little bit distressed in this area of funding, and I hope you will accept my apology.

I was a little bit pointed. I would like to ask what funds specifically have been earmarked in the fiscal year 1971 budget requests for environmental education, and under which acts specifically?

Commissioner Allen. Well, principally, it is a cooperative research program.

We have asked for a new amount set aside in title III, which gives the Commissioner of Education a certain amount of money for that. Let me submit for the record a complete listing of these items.

I do not have them all here.

(The material mentioned above follows:)

Extension of Remarks on Earmarking of Budget Funds for Environmental Education

As you undoubtedly know, the Fiscal Year 1971 budget was prepared before I assumed office as Commissioner. Thus, no funds were *specifically* tagged as "environmental education" in the budget.

I am attempting to use my authority wherever possible to encourage use of funds under existing discretionary programs for environmental education.

The Fiscal Year 1971 program budget is currently in the final stages of preparation and I am unable at this time to tell you exactly which authorities will provide funds for this purpose and in what amounts. I can say, however, that our current plans call for a *minimum* of $4,000,000.

In addition I might indicate at this time that I intend to ask for an additional $15,000,000 under existing authorities *specifically* for environmental education in the Fiscal Year 1972 budget.

Mr. Meeds. Let's direct our attention to the EPDA program which provides funds for teacher training, personnel training.

Will you get a little more specific?

Do any of you people there know if any specific funds are being earmarked for environmental education with EPDA in your budget request?

Mr. Alford. We have $200,000 requested for training purposes from EPDA funds.

Mr. Meeds. Is this over and above other funds requested in EPDA, are we going to get into the same thing we did with the drug abuse education thing, in not raising the total amount, so you take it from some other program, $200,000?

Mr. Alford. Of course, we have to wait final action of the Congress on the 1971 appropriations; but to date, of course, with the House action, EPDA has received additional sums of money for 1971, so we would assume in these cases it could be over and above, but that is depending on the final outcome.

Mr. Meeds. But you see, Mr. Alford, Mr. Commissioner, I am not at this point asking what the Congress is doing.

I am asking what the administration is suggesting.

Mr. ALFORD. We have requested more funds.

Mr. MEEDS. Specifically had you asked for more funds on environmental education?

Commissioner ALLEN. No, not in the 1971 budget, but in the 1971 budget part of the additional funds we will receive will be devoted to environmental education.

Mr. MEEDS. So we are all really getting back into the same type of thing, as we did with regard to the Drug Abuse Education Act, and which I complained of earlier.

We are going to set new priorities within the existing funds, and I will point out to you that for years we have been trying to get some funds for a vocational education program, which many of us think also is very important.

I think for the first time this year the administration has asked for funds for that. What you are really telling me is you are going to take $200,000 from some other program, which the Congress also feels is important, and put it in this environmental education matter. I am suggesting that what the administration ought to be doing is coming up here and supporting the bill, a bill. You do not have to support our bill, but with some affirmative sugegstions on new emphasis in the field of environmental education, ask for authority under which we could appropriate some funds. As with the drug abuse education matter, I am sure we can appropriate some additional funds for those programs, because they are high-priority programs, and we have a national consensus now that they are national-priority programs. It seems to me that the administration ought to be in a position of leadership here, and taking this national consensus and utilizing it to the end that Mr. Reid suggested. We should be placing new emphasis on this program, providing new funds for this program, so that we really can come out with an environmental education program, which does not have to, I will soften my word, borrow from some other program which is also important. I hope you will pardon me, but this sounds like a replay of the old record we had with regard to drug abuse education.

Will you submit for the record what specific requests are being made within the budget, or suggested budget of the administration for fiscal 1971 and 1972, if you have that, specifically for environmental education?

Commissioner ALLEN. We will in the 1971 budget. We are just beginning planning for 1972, of course.

Mr. MEEDS. I am sure.

I think that is all.

Mr. BRADEMAS. Mr. Bell.

Mr. BELL. Thank you, Mr. Chairman. Welcome to the committee, Mr. Secretary. It is a pleasure to see you here. I want to say at the outset that I am not just sure what my final position will be on this bill, but at the present I tend to favor it.

It looks like a necessary bit of legislation. I am, however, sometimes amused by my good friends and colleagues on the other side of the aisle, who proceed to say very blandly that we must have these things, that this is very important legislation.

Yes, we are concerned about this. The budget is a very serious problem, but we need more money for agricultural programs, educational programs, poverty programs, foreign aid, and for drug abuse.

Saying this does not solve these problems. We have a budgetary problem, which I think the Secretary very much recognizes.

I think the Secretary is for this bill, and I am not putting words in your mouth, but I think he is also concerned about the budget.

We have a financial problem. If you want to say, "Let's forget about the budget, let's spend more money for everything," that sounds very good, and you may get some votes. But I do not think it will solve the problems, and I believe we have to establish priorities, and perhaps this should be one.

I just wanted to say I think it is necessary to have more money, but I think we have to be responsible also.

Mr. Brademas. Mr. Hansen.

Mr. Hansen. Thank you, Mr. Chairman. May I join my colleagues in extending a welcome to you?

It is always a pleasure to have you before our committee, and I do appreciate your statement of support of the objectives of the legislation. I also appreciate your having outlined some of the specific actions that are being taken within the authority of existing programs in the area of environmental education.

I think it is safe to say that within this existing authority we are moving forward, and we are doing more than has been done in past years in this area.

I just have one or two questions with respect to some of the broader purposes of the bill, to which Mr. Reid made reference.

The bill includes in its authority that of stimulating programs of environmental education outside the regular institutions.

One of the main purposes of the bill is to try to encourage noneducational institutions, private organizations, to become involved in this educational process. As nearly as I can determine that authority does not exist under the specific acts to which you made reference in your testimony, or does it?

Commissioner Allen. Something can be done through the cooperative education program, but if you mean by some agencies outside of the traditional education practice, education television, for example, we are taking steps, as I have indicated to help through the cooperation of the Corporation on Broadcasting, and to develop programs for the public use, stimulating the public, helping to improve the environment in fighting pollution, and to give educational understanding of the problems that exist.

At least that is one illustration of what can be done outside, if you will. I do not agree that is necessarily outside, but it is one of the agencies other than regular school or college educational facility.

Mr. Hansen. You think there is an important role that can be played by the noneducational institution, the private organization in this area of environmental quality education?

Commissioner Allen. I do very much. As a matter of fact, I think one of the things we must bear in mind about education is that it is no longer something that is a 9 to 3, 5-day-a-week, 10 months of the year enterprise. It must include all parts of our society. It seems to me that the private sector as well as the public need to consider ways in which they can be of help in this regard.

The business and labor groups, industry, the media, all segments of our society can join in attacking this problem. Under our own piece of legislation, title III, which I mentioned a while ago, this legislation encourages bringing into cooperation with the public school system, the noneducational organizations: museums, libraries, and other groups not usually thought of as a part of the school system. I think what the role of the school ought to be is that it ought to be heard. The role of the educator is to bring into play along with him these noneducational agencies, so that we will enlarge the potential for attacking this problem.

Mr. **Hansen**. I was interested in your reference on the cooperation of the Corporation of Public Broadcasting, which the president of that corporation was here to testify a few days ago on this legislation, and, of course, he gave very strong support to the bill. In response to my question about specific ways in which the passage of this bill would help the Corporation of Public Broadcasting in its environmental education efforts, Mr. Macy pointed out that it would constitute a declaration of congressional intent in terms of priorities which would give important support to the kinds of programs that should be developed in this area of environmental education. Would you agree?

Commissioner **Allen**. I would agree it would serve that purpose, definitely.

Mr. **Hansen**. I have one final question.

Although you indicate for the most part the authority provided by this bill is not needed to move forward with many of the environmental educational programs, and that you are contemplating action being taken under title III and other titles, I do not see anything in your testimony, or your responses that indicate there is anything in this bill that is inconsistent or in conflict with administration objectives in this area, is that correct?

Commissioner **Allen**. No, I do not find any aspect of this bill in terms of its purposes, the kinds of programs that you suggest, that are inconsistent with what I want to do, and what I believe we can do.

Mr. **Hansen**. I will just make this final observation. I think in view of the strong support that has been developed thus far from a variety of forces across the country, and the great interest in the Congress in this legislation, it is fair to say it will pass, and as it does pass and is implemented, I am confident that we can count on the full cooperation of your Office, and of the administration in carrying out the objectives on which I think we do have very substantial agreement.

Commissioner **Allen**. You certainly can, yes, sir.

Mr. **Hansen**. Thank you again for your very helpful testimony.

Mr. **Brademas**. Mr. Secretary, I have a few more questions to put to you, one of which has to do with my lines of questioning which you had, the colloquy that you had with Mr. Meeds, and in which he expressed his concern about the posture that the Office of Education has been taking with respect to meeting pressures for funding a variety of programs out of existing legislative authority, and I believe I am right in saying that this is the position you have taken with respect to the drug abuse field.

You have turned elsewhere to get the money for that, and some of us have been trying for some weeks now to define the mystery of where you are getting the money for your Right to Read program.

We have had a hard time understanding that, and we have been told, I guess, that some of the resources for that will come from the additional funds for title III, and title II of ESEA, that the administration told us it did not want us to vote on it.

Now, not having voted it, you are going to reach into that till and use the money from elsewhere for that, which is I think kind of a fascinating metaphysics, not to say politics, and what concerns me is that if you take the line that in response to every partisan effort in Congress to move ahead, to meet some urgent need in education, such as in preschool education, or right to read, or drug abuse, or environmental education, you are going to reach in and take money from some other program, like the education professional development act, or title I, or title III of ESEA, which were programs initially intended by Congress to be supported under those legislative authorities. You are going to keep dipping into that pot, and you are never going to have anything left for the programs that Congress intended be supported. That is, I take it, that this is a problem of which you were unaware of, is that correct?

Commissioner ALLEN. I am very much concerned about it. I can assure you I have not been one who has been shy about asking for adequate funds for the support of education.

Anybody that knows the background of my career knows I have been pushing in that direction, but once the matter is settled as to what the budget is, then it is my responsibility to try to see to it that the priorities that we have determined upon, and that the Congress has urged upon us, are financed as well as is possible, within the funds that are available, and we shall continue to do that.

It is not a question that all of these things are of great urgency, and will require looking into down the road for substantially more money. I indicated when I announced the reading goal last fall that this would be a year of planning. This was not the year when we would be putting a lot of big money into that project, because we need to develop plans on how to spend the money, and that has been going on; and I hope before long I shall be able to present to the administration a proposal for a more substantial support of that goal.

Mr. BRADEMAS. You have talked about money. Could you give us your judgment, having looked at the proposed bill, could you give us your judgment on what would be a reasonable amount of money?

I am not now talking about the current fiscal problems, but what would be a reasonable amount of money to fund the programs contemplated under this bill, say over a 5-year period?

Commissioner ALLEN. Well, I think I would like to consider that and send it to you, because that is a very big question, and one which will require more careful thought than I can give just at this point. Let me develop a ball park figure that might be useful to the committee.

Mr. BRADEMAS. I would be glad if you would, because I have been privately advised one of the reasons the administration is unwilling to give suport to this legislation is that the Budget Bureau thinks if we try to write this bill into law, that we will try to run away within the terms of the amount of money, that we would want to authorize.

That in all candor is not our intention. We are trying to write a sensible and sound bill, and I think it ought to be significant that we did not write any dollar figure into this bill because we did not want to come in with a prejudgment.

We have had one witness who has given us a proposed budget, which would be for the several programs contemplated in the bill, for over a 5-year period, $5 million in the first year, about $11 million in the second, about $13 million in the next, and $15½ in the fourth, and in the fifth it woud be $21 million, which would mean about $65 million over a period of 5 years.

I do not think that can be regarded as a grandiose figure. I am not saying that is the one of which I am wedded to, but this is a figure that has been suggested to us by someone who has done a great deal of thinking about this problem, and that would average out at about $13 million a year.

thinking about this problem, and that would average out at about $13 million a year.

Commissioner **Allen**. Did he break it down how he would spend that?

Mr. **Brademas**. Mr. Secretary, I would be very pleased to make available to you this document, because it has been very carefully thought out by a very able person in this field, and it might be of some assistance to you.

I would be interested also in getting your figures in regard to that matter.

Commissioner **Allen**. I will be most happy to send in a ball park figure to you.

(The figures referred to follow:)

Fiscal year:	
1971	$12,000,000
1972	15,000,000
1973	25,000,000
1974	35,000,000
1975	40,000,000

Mr. **Brademas**. Now, I would be interested also in Mr. Sallada, he is with you here today, and in getting some information about just what his task force on environmental ecological education is planning to do, how much money you have in your budget for that particular shop.

As I understand it, you are the director of the task force on the environmental ecological education?

Mr. **Sallada**. I am chairman.

Mr. **Brademas**. How much of a staff do you have?

Mr. **Sallada**. We have a staff of about three people, directly, and then we have six to nine cooperative education students that work for us, and we have two full-time consultants who joined us 3 weeks ago.

Mr. **Brademas**. What kind of an annual budget do you have?

Mr. **Sallada**. Basically, as far as the budget, it is not a budget, for it is just salaries. There is no direct budget for that effort.

Mr. **Brademas**. So you really do not have a great deal of money.

The reason I raised this, is that once again, I referred to the report of the Citizens Advisory Committee shared by Mr. Rockefeller, which indicated 2 years ago, and this is August 1969, that report, the committee recommended that an environmental unit be established in the Office of Education, and in response, an existing staff member was given the title of coordinator, and assigned an impressive list of responsibilities, however, lacking a supportive staff, the coordinator has been unable to fulfill these responsibilities.

I suggest to you with the kind of staff that you just outlined, and the growing interest in this field in the United States today, you are not able to do very much. You are going to be swamped.

Mr. SALLADA. We are apparently swamped. I think one of the points that should be made for the record is that we are currently, through the efforts of the task force, assessing what the needs are as far as the staff is concerned in this area. At the same time we are trying not to create another bureaucratic unit within the Office of Education that sets itself off separately from other educational programs.

I think the Commissioner's intent in setting up the task force was to review and assess the state of the programs in the Office of Education, and how those programs could be better utilized for the problems of environmental education.

That is exactly what the task force is doing at this time.

The members of the task force were assigned from each of the bureaus to have direct liaison with the bureau chief, the associate commissioners, to serve at the pleasure of the commissioner, and to carry out that mandate, because, as you know, environmental education not only involves environmental research, it also involves the whole aspect of manpower training. All of these programs and the current legislation are now being reviewed and assessed for a report to the commissioner to be given to him on July 1. As for our direction in the future, we do not know at this time.

Mr. BRADEMAS. In your estimate, you would say with respect to training, this involves the area of manpower training.

I do not know if I would agree with that, because if we are talking as this bill in large measure is addressed to, about the question of generating support for elementary and secondary grade school courses in environmental education, we are talking about the training of elementary and seconday school teachers, who are not normally trained in this country under the Manpower Training Act, nor are they trained under the Vocational Training Act, and I have a hard time to believe that you people understand what we are talking about.

Mr. SALLADA. I did not mean to imply the manpower effort is related to your bill, but rather it is one of the efforts, the manpower efforts, that we are looking at as a part of the task force.

Mr. BRADEMAS. What kind of projects are presently funded by the Office of Education for teacher training at the elementary and secondary school level in environmental studies, if any?

Mr. SALLADA. No, not currently.

Mr. BRADEMAS. That again comes back to what Mr. Meeds was talking about to you about the drug abuse educational bill.

You tell us you have all of this authority to do these things, but when we ask you what you are doing, the answer is nothing.

Mr. SALLADA. Sir, I do not think that is quite fair. The task force was formed on February 9, and we are just beginning to form a plan as far as the Office of Education is concerned. We are not doing anything other than what I have described so far, and with regard to environmental education, nothing was done prior to this administration.

Mr. BRADEMAS. I have no excuse for the prior administration, and I am glad to be just as critical of them, except the world is a different world in 1970 from what it was in 1969, and the impression that I have is that that message has not gotten through downtown.

We keep getting the same old stale answers up here.

What kind of guidelines do you plan to have to judge whether you want to fund the title III project in this field, considering also to the fact that now you have to work through the States?

Mr. SALLADA. As far as the guidelines for title III, again, all I can say is that we are waiting for an interim report of May 15, a final report of July 1, and we would hope in that effort, in the short range, we are currently at the stage of setting aside [illegible] for the evaluation of the title III programs.

They are now collecting, and they have collected, most of the materials related to the title III programs, and they are setting aside funds.

I was informed by Tom Burns and Commissioner White that the plans are to be announced, about the study of all the title III programs.

Mr. BRADEMAS. Have you read the Rockefeller committee report?

Mr. SALLADA. Yes; I have. I am aware of that section that you cited about the failure of the title III programs to give proper dissemination of those programs, and I think that is an inherent weakness in that title. As for the task force, we would agree with that statement.

Mr. BRADEMAS. I was just wondering why you waited this long to be about it, in view that that report was published 9 months or so ago.

You now tell us that we can look forward to getting an interim report.

Mr. SALLADA. Again, the task force was only formed on February 9. That came to our attention only within the last month.

Mr. BRADEMAS. Let me ask you this question, which now gets more to the substance.

You have been working in this ecological field for a time.

What would you regard as the kind of considerations that ought to go into determining whether a title III or title I ESEA project should be approved for environmental studies, what are the objectives of that criteria that you would think ought to be built into any kind of environmental programs at the elementary and secondary school programs?

Mr. SALLADA. I think it is critical that any effort we make in elementary and secondary education include the kinds of structures where students are able to benefit from an interdisciplinary approach in learning environmental education.

I think it is one of the great problems right now in education, with regard to the training that the students get, and the teacher efforts are becoming increasingly fragmented. I think the other opportunity that is required is one where we go beyond the concept of the four walls that the students are confined to, and they should have flexibility to be able to get out into the environment and see the interrelationships of the total environment in our ecological systems in order to understand it. I think that is critical. A third thing is related to understanding. It is very important that teachers be trained to enable them to impart this kind of education that combines the outdoors as well as the conventional type of education, one that has curriculum, that stimulates the mind to see the inner relationships of our ecological systems, and the systems that we live in, the air and water, the functions of our body. It would be important that that kind of flexibility of education be involved, and this would be in title III and preschool.

Mr. Brademas. Mr. Sallada, I think that is very helpful, and in my judgment you have done a splendid job in describing the purposes of the bill that we are considering.

Mr. Secretary, you said with respect to the environmental studies, one of your hopes, if I read you right, was to encourage the States to take a more active part in this respect in supporting environmental studies.

Has any survey been made to show what the States are doing, and what we are now doing calling environmental studies?

Commissioner Allen. Well, we requested that they begin immediately to develop plans and submit their plans to us to give us some kind of indication of what they are doing, and these plans are now coming in.

We are also going to be meeting with the State educational leaders later this spring, and this is something to which we intend to invite their attention.

I think that, at least from the reports that are coming in, virtually every State is beginning to turn its attention to this increasingly.

New York State, for example, has set up its own special division or unit of environmental education.

I do not want to leave the impression here that the education community throughout this country is just sitting waiting for somebody in Washington to tell them what to do. They are moving. They have the same kinds of concerns being expressed in the States and localities that are expressed here in Washington, and a lot of it is going on. We intend through our task force, Mr. Sallada's office, to keep abreast of the progress they are making, and the activities that are underway there, and we hope to disseminate the best of these practices.

There is not anything being done that is adequate, and will not be adequate in my judgment for some time until the country itself is awake to the fact that this must be a life and death matter. I believe the kind of steps that this committee is taking, the steps we are taking in the Office of Education and elsewhere in the administration and the Government, will all help arouse the country to their duty in this regard, but it is going to take a lot of effort through all parts of our Government, not merely at the national level.

Mr. Sallada. We would like to submit the first plan that came to us, and it is the New Jersey plan, the most imaginative plan that I have seen.

It was stimulated, not by the Office of the Commissioner of Education, but by the State of New Jersey, and it should be applauded along with the Governor and those working hand in hand to develop this plan, and we would like to submit that to the record along with the other State plans.

Mr. Brademas. I know the report well. Dr. Edward J. Ambry, director of the New Jersey State Council for Environmental Education, who helped develop the New Jersey plan you refer to, testified before this subcommittee on April 11 in New York. The report was submitted for the record at that time.

If you are in agreement with what they are doing, I beseech you to reconsider your position.

Mr. Secretary, this is one point that I would like to make when you talk about the fact that all of the concern is not at the national level.

That again is a standard response we hear, but I call to your attention the drug abuse bill again.

Now, it may be true that people across the country are concerned. I have no doubt about that, but it is also true that when you are listening to administration witnesses, such as have come before our subcommittee last year on the drug abuse educational bill, and they were unable to tell us what the State department of education was doing in regard to drug abuse education, because you had not bothered to take a survey of what they were doing, and we were all concerned about it. We also find in our State, Mr. Secretary, New York, that the laws are being violated in the State of New York, in that this is mandatory under New York State law for any public school that receives State aid to offer courses in drug abuse education, and we had clear testimoney of this fact that this law, this mandate, is not being followed, so that while there may be concern across the country, and the States, that concern does not seem in many respects to be followed through.

You take the preschool program. How many States did a thing about the preschool education in this country, until the Federal Government passed Headstart?

This is where some of the initiative of these programs happily runs, and seems to come from, and here is where it seems the initiative for environmental education comes from.

They are not doing anything about this in the State of Indiana. I will tell you that. So I appreciate the point you make, but I will come back by way of concluding my own questions and comments to what you said, Mr. Secretary; to quote you, you said, "This is a life and death matter."

That is what you just told us. If it is a life and death matter, I do not understand why the Nixon administration does not endorse this.

Commissioner Allen. I might say in connection with some of the programs adopted in the last few years in education, it is true the Federal Government took a lead, but I would say some of us from the States, I being one, were on the task force that promoted these programs. So, oftentimes the pressures do come back in the States to boost the Federal Government to take action.

Mr. Brademas. If every State had a chief officer like James Allen, and as New York State, I would be delighted.

Well, you have been very kind to put up with our questions this morning, and we appreciate your coming to give your testimony very much.

Your testimony is certainly very much appreciated by the committee.

Commissioner Allen. Thank you, Mr. Chairman.

Mr. Sallada. Thank you.

Mr. BRADEMAS. Our next witness is Mr. John Osman, staff director of the urban policy conference program at Brookings Institution.

We are looking forward to hearing from Mr. Adrian S. Fisher later this morning.

So, we thank you for coming, Mr. Osman, and please go right ahead.

STATEMENT OF JOHN OSMAN, STAFF DIRECTOR, URBAN POLICY CONFERENCE PROGRAM, BROOKINGS INSTITUTION

Mr. JOHN OSMAN. Mr. Chairman, members of the committee, I am John Osman, a senior staff member and director of the urban policy conferences of the advanced study program at the Brookings Institution.

The opinions stated here are my own and do not purport to represent the views of the other staff members, officers, or trustees of the Brookings Institution.

Urban policy conferences are continuing policy planning processes in which we work with the civic leadership of cities, regions, and States in policy analysis and policies planning.

Conferences have been conducted for approximately 10 years.

They have as their purpose to inform policymakers concerning the newest knowledge and the results of recent research in urbanization.

In the course of 10 years, this policy planning process has been institutionalized in more than 25 places and has had an impact upon an impressive number of policymakers from the public and private sectors of American life.

We understand urbanization to be a resource; the source of economic and social energies; and we look upon cities and towns as technologies to transform the energies generated by urbanization into the new institutions needed by a changing society.

It requires a revolution in policymaking to approach urbanization as a positive rather than a negative force; to consider urbanization as a constructive instead of a destructive influence in human affairs.

The process of urbanization can be compared to the flow of a great river.

Energies lying latent in the river are lost. They are destructive, until the technological system of dams, turbines, dynamos, and an electrification system extracts and disciplines the energies of the river.

So it is with urbanization until the technological system of cities and towns, of transportation and communications, and of social and economic institutions organizes and orders the flows of human energy.

Intensification and extensification of urbanization has to be supported by a tremendous manmade technological system.

Consequently, urbanization has tended to transform the natural environment into a manmade environment.

As you know, almost all of northern Italy, the Rhine Valley, the Netherlands, and England are manmade environments. Little remains of the original and natural state of these parts of Europe.

The transformation of the United States into a total manmade environment is taking place rapidly.

For some time, our Conferences have included a unit dealing with the ecological revolution, or the emergence of this manmade environment.

This unit considers ways in which urbanization has extended the reach of the public interest and produced a new political geography with new policy areas which, in turn, require new policy perspectives.

We have endeavored to invent the new policies needed to guide the evolution of the extended environment. Embryonic institutions such as councils of governments and development districts find it difficult to embrace emerging large-scale environmental problems.

Our task has been to help invent political models, economic models, and ecological models to assist the policymakers in these new polities as they build the new institutions needed by an advanced urban age.

We have been concerned with the ecological balance and the environmental quality of a number of changing regions of the Nation such as Hampton Roads, the Carolinas Piedmont, Dallas-Fort Worth, Maricopa County, Arizona, the Midsouth, the Ohio Valley, and the State of Alaska.

In the past, we approached environmental issues in two ways, from the perspectives of politics and of economics.

Neither the political nor the economic approach was entirely satisfactory.

Several years ago, we began to introduce natural scientists into the urban policy conferences in addition to the political scientists and the economists who had been dealing with environmental policy from their points of view.

A conference on the future of the Ohio Valley is presently in process.

Civic leaders from the four States of Indiana, Ohio, Kentucky, and West Virginia meet regularly to formulate policies that will invent the future Ohio Valley.

An effort was made at the last several seminar sessions to draft an Ohio Valley environmental policy.

Among other things, we considered an ecological model or a mathematical model of the total Ohio Valley which could be used to control the quality of development.

We have editors of major newspapers, managers of important industries, and distinguished public officials present, but it is apparent we do not have a satisfactory ecological foundation for formulating an Ohio Valley environmental policy.

We conducted a conference on the future of Alaska this year at the invitation of the State legislature.

I was impressed with the deep sense of dedication which all Alaskans have for the natural beauty of their State. I share this devotion to the mountains, the glaciers, the streams, and the tundra, to the wildlife wandering in this wilderness.

Most of the arguments advanced for particular policies were the product of personal opinion, however, rather than resulting from sound scientific knowledge about the ways in which development would disturb the ecological balance in Alaska.

More knowledge is required if satisfactory policies are to be pre-new State department to deal with environmental concerns.

In my judgment, the environmental era will produce a revolution in the policymaking process.

When the urban policy conference commenced in 1960, the major policy issues included metropolitan government, urban renewal, and the revitalization of central business districts.

We drew largely upon the academic disciplines of government and sociology for the knowledge needed in policies planning.

It was well into the 1960's before a district urban economics and an urban geography generated new insights into the urban process through the information these disciplines discovered.

In those years, the contributions of the policy scientist to the policymaker were the metropolitan government model and the economic base model of the ever-expanding urban system.

Conditions confronting the policymaker at all levels of the public and private sectors have changed, and his information needs have changed, too.

We enter an ecologically oriented era, and there are reasons for it.

Industrial development and increasing demand for energy have disturbed the ecological balance and eroded environmental quality.

Highly industrialized countries, like England and West Germany and Japan, have reached similar stages in their environmental evolution.

It appears the United States is the first country in history, however, which has reached such an advanced stage of evolution that it can consider shifting the emphasis of its public policies and programs from a concern for economic development to a commitment to environmental quality.

More importantly, perhaps, the United States is the first nation to be able to entertain the idea of requesting its industrial system to shift from a quantitative to a qualitative production of goods and services.

If the technological transformation of the American life style caused the environmental crisis, then the inventiveness of the American industrial system should provide the road to ecological redemption.

However, such an ecological revolution requires a reorientation of the policymaking process of this country

This reorientation has to happen at all levels of policymaking, in city hall, in county courthouse, in State capitol, and in Washington.

The ecological revolution in policymaking requires a reordering of the policy sciences.

We have endeavored to recognize this new order in our conference programs.

Where the policy sciences have been traditionally Government, economics, and sociology, essentially the social sciences, the environmental era expects to include the natural sciences as major resources for policymaking purposes.

Physics, biology, botany, chemistry in all their combinations, studies of the natural and living systems, all now have a part to play in the making of environmental policy.

The new geography and ecology encompass the two realms of sciences. And engineering has its place in the application of the new policy sciences.

Emergence of the environmental era places new intellectual demands upon the policymaker and the people.

One foreseeable implication of the emerging era is the emphasis on environmental issues in the political process.

What are the fundamentals of the ecological concerns confronting the Nation?

To what extent do an expanding population and associated technologies threaten the natural life processes?

Where is the realm of reconciliation between essential economic endeavors and environmental erosion?

How does a free-enterprise, market-oriented economy shift from quantity to quality production?

What is the scientific basis of ecological balance in the various regions of the Nation?

These are some of the hard questions to be answered by all Americans in the environmental era.

Unfortunately, the average American enters the environmental age uneducated in the natural sciences and unable to use their knowledge in discharging his responsibilities of citizenship. Indeed, only a few select individuals are educated to use the lessons of the natural sciences in the production of policies dealing with environmental problems.

Understanding the intricate interrelations in the ecological system is essential, however, to the preparation of an effective environmental policy. Such an understanding will provide a necessary new system of ideas and, hopefully, furnish the framework for analyzing and planning policy.

If the average American and the policymaker need education in the environmental-oriented sciences in order to place ecological problems in the proper political perspective, then, on the other hand, the scientists need to understand how to make their knowledge relevant to the civic dialog dealing with the preparation of policy.

Environmental education is essential at all levels of the American society; and is a particular aspect of the policymaking process.

In the absence of such education, all Americans can become altogether too dependent upon the expert since we will be dealing with highly sophisticated bodies of scientific knowledge in the environmental era. Unless a sound scientific basis for environmental policy is established, irreparable mistakes will be made by well-meaning people.

Witness the present predicament of the trans-Alaska pipeline and the activities associated with it. To what extent are the arguments advanced by both sides of the controversy based upon sound ecological foundations?

Consider the South Carolina situation in which the chemical plant proposed for the tidewater threatens to become a casualty of a controversy which appears to ignore the scientific facts about the pollution of the Edisto estuary.

It is necessary in the environmental era that the policy planning process have a sound scientific base.

Fortunately, the ecological system is subject to scientific inquiry and study, and environmental policy can be quantified.

Recognizing there will be always an emotional element involved in environmental matters, maybe such subjectivity can be molified by scientific objectivity based upon a sound environmental education as proposed in the "Environmental Quality Education Act."

As an emphasis upon economic growth is replaced with a dedication to environmental quality, the need for understanding the ecological system suddenly emerges. Consequently, it is important that education to enhance everyone's understanding of the ecological system be made available soon.

Environmental teach-ins and Earth Days emphasize the crisis; serious study will be necessary to correct the conditions confusing the ecological systems of this country.

Such education is important in the public schools, at the undergraduate level of the college, or at the graduate level of the university, but it is even more important today outside the walls of academia, among the citizens with the ballot, and the government officials and legislators who determine the direction of environmental policy.

In the immediate years ahead, it will be obligatory to educate Americans in order for them to deal with the policy issues to be produced as the energies of economic development demanded by the American system degrade the quality of the environment.

Let me illustrate how the "Environmental Quality Education Act" might be implemented by using a program in present preparation for the midsouth this coming year.

The purpose is to produce a midsouth environmental policy. The new knowledge and recent research into the nature of the ecological system will be presented to the Conference by the leading environmental scientists.

In the course of the Conference, teams of task forces will seek out existing environmental problems.

Each team will be accompanied by scientists and lawyers, scientists to establish the scientific nature of the problem, and lawyers to learn if any new laws are available to be applied to this condition. In this manner, the midsouth ecological system can be examined scientifically, and its problems probed in the light of the newest knowledge.

Inevitably, an advancing America moves into what has been called the environmental era. Its people have not been prepared to assume the intellectual responsibilities of the era. The "Environmental Quality Education Act" would assist in preparing all Americans for the intellectual challenges confronting them as citizens in the years ahead.

Mr. Chairman, members of the committee, I endorse this bill enthusiastically.

Mr. **Brademas**. Thank you very much for a most helpful and thoughtful statement, and the Chair wants to express appreciation to you for testifying, because it is not of convenience, and that is one of the reasons why I appreciate it so much.

Another of the reasons why we wanted to hear from you is that you have done more than I think most institutions in the country have done in conducting conferences in which outside of the formal education unit this has been accomplished.

Have you developed some kind of teaching materials that you believe to be particularly appropriate for the kinds of people that participate in your congresses?

Mr. **Osman**. Yes, we have.

Mr. **Brademas**. Could you generally describe their nature?

Mr. **Osman**. First of all, we bring to these conferences the leading scientists in the environmental field. These men are engaged in research, and they are relating their research to the public problems, and they confront the Conference members who come from both the public and private sectors of the society with this research. For instance, the Institute of Ecology at the University of California at Davis has developed an ecological model of the State of California.

It is a mathematical model that enables the institute to work with a variety of problems, put them into computers, and come out with forecasts of the impact of this particular event on the environmental system of the State.

We bring this ecological model to the attention of groups of policymakers in different parts of the country. We take the results of work done at the Missouri Botanical Gardens in St. Louis and at various research centers and relate the research to particular policy issues.

In addition to introducing the live research results, we have identified important readings in the field of the environmental sciences that are helpful to a corporation board member, to a public official, or whomever we have in our conferences. We assemble a body of readings which represents the most useful materials available to inform the policies planning process.

A tremendous amount of material is making its appearance these days, and as anybody knows, the problem is to sort out those readings that will be relevant.

If we have a program in Alaska, we have to assemble the materials a little differently from the way you would if you are working with a program in the Piedmont Carolinas. We do have a structured program, and it has these two information aspects, the results of recent research presented by visiting specialists and published materials assembled into books of readings.

Mr. BRADEMAS. That is very helpful, because I take it in your testimony, you appreciate one of the purposes of this bill is to provide support for the kinds of community conferences and adult education and institutes and so forth and for stage and governmental officials, business and industrial leaders, and civic leaders, that I think you have been doing through the conferences, is that correct?

Mr. OSMAN. This is correct, and we have been involved in a couple of the large environmental issues, particularly in our programs in Alaska and in South Carolina.

Mr. BRADEMAS. I was also struck by your statement that in your judgment the environment era will produce a revolution in the policymaking process, and I thought when you described this California model of what Margaret Mead told us here the other day, she thought we ought to have an island set apart which could serve as a sort of independent ecological unit to study and in which to learn, and then we got into a discussion of the thing that apparently they may be doing in California, using simulated variables in computers, and I could well see, if you got mayors, county commissioners, Governors, all sitting around talking as we are now, and being able to turn to a computer, and get some idea of what the impact on the environment is in their own area, statewide and regionally, or for various public policy decisions, that this could well produce the kind of evolution we speak of.

Mr. OSMAN. We are talking the same language. That is what we do in the program, except we are not using the computer itself right now.

We are using the conceptual model, and we are putting the variables into the model and tracing these through their interactions but actually, we are using the conference itself as a sort of computer, to trace the impact of certain public policy decisions on the environment. We would like to use the computer, and that is what is going to happen in many instances in the future.

We are working with the Ohio Valley where we have 14 institutions of higher education involved. One of the consequences of this program in the Ohio Valley is that these institutions are planning to set up an institute with a computer system, and when they will have built a model for the Ohio Valley, the decisionmakers of the Ohio Valley will come together to put the various data into the computer, and see what happens to the ecological system.

Mr. BRADEMAS. That is very encouraging. I would just like to say that I think, Mr. Osman, that your statement indicating that more knowledge of scientific base will help professionally to satisfy the policymakers in their decisionmaking from the environmental point of view. It hits the nail on the head, because, as I see it, the teach-ins, and Earth Day dramatize the problem, but we have got to have the scientifically valid knowledge on which we can then rely if we are going to have effective policy.

The other point I would make is that I would hope that the various academic disciplines, such as political science, sociology, and anthropology, in addition to the natural sciences, will begin to think through the contributions that will be made by their disciplines to this ecological revolution and public policymaking decisions.

I would finally hope if you would make available, if it is not too much to ask, some of the materials that you and Brookings have prepared at your urban policy conferences in the environmental field to the U.S. Office of Education, which seems desperately in need of any intelligence and information that they could get their hands on.

Mr. BRADEMAS. Mr. Hansen.

Mr. HANSEN. Thank you, Mr. Chairman. Let me also express my appreciation to Mr. Osman for his testimony.

He has presented really one of the most thought out statements that we have had the pleasure of hearing in the course of our consideration of this bill.

In terms of addressing itself to environmental issues, it has done that, and I was impressed with all of it.

There is one part that caught my attention particularly, and I would like to pursue with a question. On page 5, you made this point:

> If the technological transformation of the American life style caused the environmental crisis, then the extraordinary inventiveness of the American industrial system should provide the road to ecological redemption.

Now, as I understand what you are saying, that the technological question, that the technology that we have developed, and I presume the energy that is necessary for the application of this technology, must now be directed toward what you have termed the ecological redemption, and let me ask you a further question if I understood you correctly.

Is it not also going to be necessary that we sort of retransform this same life style that seems to have involved a series of demands, the satisfaction of which has made such a severe impact on the environment?

Mr. **Osman.** Yes. There is unquestionably an ethical content to this, a behavior content, and people will have to change life style; yes, I would agree with you.

My point in the passage was simply that the same skills which have marked the industrial development in this country, must now be turned toward improving the industrial performance.

I did not want to address myself to the ethics of this problem at this time. This is a big topic, and I did not want to address myself to that aspect of it, but if you are suggesting we may have to change the patterns of our behavior, the answer is, "Yes."

Mr. **Hansen.** Let me go back to the original point of before, and comment on a statement that I heard from Dr. duBridge made recently relative to the GNP.

The GNP has been singled out as a target, I think, in the course of our assessing the deterioration of our environment, resulting from industrialization, Dr. duBridge made the point that rather than slowing down the GNP, that we will really need to provide the kind of energy and the technological development in order to attack the problems of pollution, that we should turn the GNP into an instrument for enhancing the quality of the environment.

Do you agree?

Mr. **Osman.** Absolutely. That would seem to be to be the thing to do, and we will have to do just that, and there are signs that industry would like to do this.

Mr. **Brademas.** I would like to say that the text of an article by Edwin Dale of the New York Sunday Times Magazine on the point to which the gentleman is addressing himself, in which Dr. Dale, who is the economics writer, makes the point that we will have an increasing GNP in this country, whether we like it or not, and that is therefore a moot question.

The question is what kind of GNP you will have, and how you harness some parts of it.

Mr. **Osman.** Approximately 50 percent of the GNP is information right now. The more sophisticated and advanced the economy becomes, the more the GNP is the result of the production and distribution of knowledge. The more the GNP is information based, the less you would be polluting the environment.

The GNP is changing in its nature. I am trying to make a point about the new industrialization, that there is a qualitative aspect to the GNP now, so that the GNP does not represent some of the products that it used to represent, that were producing a lot of pollution, and this may be an important aspect of the environmental crisis a few years from now.

Mr. **Hansen.** I see one little danger in that trend. Many of us are accused of contributing to what is termed "word pollution," so there may be dangers there. [Laughter.]

Thank you very much.

Mr. **Brademas.** Mr. Osman, thank you for a most valuable statement.

Our final witness for this morning is Mr. Adrian S. Fisher, representing the Association of American Law Schools, and he is the dean of Georgetown University Law School.

I might say he is one of the most distinguished public servants of this country in this century. I hope that does not undo him, but that is what the Chair thinks anyway.

He has held a variety of high-ranking positions including that of dean at Georgetown University, as I had stated, and he has been General Counsel of the Atomic Energy Commission, legal adviser for the State Department, and Deputy Director of the U.S. Arms Control and Disarmament Agency, and he represented the United States to the Geneva Disarmament Conference over the period of years, and now is serving at Georgetown.

We are very pleased to welcome Mr. Adrian S. Fisher.

STATEMENT OF ADRIAN S. FISHER, DEAN, GEORGETOWN UNIVERSITY LAW SCHOOL, REPRESENTING THE ASSOCIATION OF AMERICAN LAW SCHOOLS; ACCOMPANIED BY MICHAEL H. CARDOZO, EXECUTIVE DIRECTOR, ASSOCIATION OF AMERICAN LAW SCHOOLS

Mr. FISHER. Thank you very much, Mr. Chairman. I really was quite undone by your remarks. You may have observed my hesitating in walking up, on the theory you could not be talking about me, so I wondered who it was that was going to appear.

I thank you very much for the opportunity of appearing. I really would like to indicate the importance that the legal profession itself puts on the problems of studies of environmental education, by referring you to a statement that you may already be familiar with, but I think it would be good to have it in the record of this committee, and that is a statement made by the president of our association, Dean Jefferson B. Fordham, of the University of Pennsylvania Law School, before the Special Education Subcommittee of this committee, in which he cited the problem of environmental law as an example of the areas in which the law schools have to move in order to meet contemporary concerns and the growing demands of the legal profession.

He pointed out that there are approximately 100 courses in law schools around the country, specifically labeled environmental law.

He went on to point out that the program theme being planned for the 1970 annual meeting of the Association of Law Schools is "Man and Nature," and he expressed the hope, Mr. Chairman, that this program will stimulate additional interest in the teaching of law courses, and conducting of teaching research, dealing with the problems of the environment.

Now, it is not unlikely that the work of the association in concentrating on the environmental matters, if it is thoughtfully done, will stimulate greater research.

There is a potential for curriculum development here, and I regard this as particularly important, Mr. Fordham has pointed out in his statement the disciplinary aspect of teaching and research in relation to environmental matters as particularly noteworthy.

He ends his comments by saying this is a problem area of vital concern which affords exceptional opportunities for law faculties and students to set their sights in the field of physical and natural sciences and to relate scientific methods and findings to the law.

Now, I think I could best state, Mr. Chairman, to put a little meat on the bones, a rather bland statement, that there are approximately 100 courses in law schools around the country specifically labeled "environmental law" according to the current catalogs and that does not include the Georgetown University Law Center; but in the next catalog, it will be there, because we have it hidden under law and social change. But we felt when we were developing a new course, such as this one, that the law school should assign it to a practitioner, familiar with the field, who is teaching part time at night, as a start. I am, of course, quite familiar with that process, because I taught in the law school, part time at night for 6 years, at a salary which is a little better than the wages and hours law permits, but not a great deal.

We will be putting on a new course in the next semester on the subject of environmental law. It will be a seminar, and since we are still in discussions with others about the scope of the outline, I would like, if the Chair would permit, to submit for the record in a day or two what we conceive to be the proper scope of a law school course in the problem of environmental law.

Mr. Brademas. It will be made a part of the record.

(The document mentioned above follows:)

Environmental Law Outline

I. NATIONAL ENVIRONMENTAL POLICY ACT OF 1969

A. Far-reaching declarations of purpose and national policy.

B. Effects on other laws and legal relationships; introduction to specific substantive areas to be examined later in detail:

1. "Congress authorizes and directs that, to the fullest extent possible . . . the policies, regulations and public laws of the United States shall be interpreted and administered in accordance with the policies set forth in this Act. . . ."

Examples.—FAA airspace regulatory authority had been based upon need to provide for "safe" and "efficient" use of the airspace. Can airspace authority now be used to protect parks? Must it be so used? What other environmental interests could be similarly protected?

What other federal regulatory authority may now be invoked to protect such interests? Legal actions based on "the public interest, necessity and convenience"? What jurisdictional lines are now displaced? Does this, for instance, give AEC the authority (or duty) to regulate for thermal effects? Might it give other agencies the authority or duty to regulate for limits of radiation exposure? Effect on non-regulatory federal programs (e.g., grants, contracting).

2. Effect on private rights to sue for abatement of environment nuisances under this Act, other federal laws, or state laws; possible personal liabilities: "The Congress recognizes that each person should enjoy a healthful environment and that each person has a responsibility to contribute to the preservation and enhancement of the environment." Also consider private rights to enforce requirements discussed under paragraph 3 below.

3. Effect on federal administrative techniques: new requirements that all federal agencies, inter alia, "utilize a systematic inter-disciplinary approach which will insure the integrated use of the natural and social sciences and the environmental design arts in planning and in decisionmaking which may have an impact on man's environment"; requirements for explicit detailed environmental findings in "every recommendation or report on legislation and other major federal action significantly affecting the quality of the human environment. . . .".

4. New "Council on Environmental Quality".

II. SCOPE OF FEDERAL ENVIRONMENTAL INTERESTS

A. Public lands:

1. National Forests: Act of June 4, 1897; Multiple-Use Sustained Yield Act of 1960.

2. National Park System legislation.

3. The Wilderness System: Wilderness Act of 1964.

4. Preservation vs. Multiple-Use (forest and mineral exploitation, game "management") vs. Facility-oriented recreation.

B. Estuarine Areas: Public Law 90–454.

C. Wildlife: Fish and Wildlife Act of 1956; Fish and Wildlife Coordination Act (1958); Programs of Army Corps of Engineers and FPC: Section 4(f) of DOT Act.

D. Historic Preservation: National Historic Preservation Act of 1966; National Register of Historic Places; Advisory Council on Historic Preservation; State liaison offices for historic preservation; Section 4(f) of DOT Act.

E. Air Pollution: The Clean Air Act (Public Law 88-206); National Emission Standards Act.

F. Water Pollution: Federal Water Pollution Control Act of 1948; Water Quality Act of 1965; Clean Water Restoration Act of 1966; Muskie Bill: S. 7.

G. Oil Pollution: National Multi-Agency Contingency Plan; Refuse Act of 1899; Oil Pollution Act of 1924, as amended; International Convention for the Prevention of Pollution of the Seas by Oil (1954) as amended (1962); The Convention on the Territorial Sea and the Contiguous Zone (1958); Oil Pollution Act of 1961; Federal Water Pollution Control Act of 1948; Outer Continental Shelf Lands Act; Federal Disaster Assistance Act of 1950; Limitation of Liability:

Under 46 U.S.C. § 183.

International Tanker Owners' Voluntary Scheme.

Muskie Bill (S. 7, proposed Water Quality Improvement Act of 1969).

International Maritime Consultative Organization: draft convention on civil liability for oil pollution.

Torrey Canyon case.

Santa Barbara litigation.

H. Solid Waste Disposal Act (Title II, Public Law 89-272).

I. Federal impacting programs: Corps of Engineers; South Florida case study:

Federal Power Commission: Federal Power Act; Natural Gas Act; Scenic Hudson Preservation Conference v. FPC; HUD-Urban renewal.

Department of Transportation activities: Section 4(f) of DOT Act: Two-hearing procedure: PPM 20-8; Planning requirements under 23 U.S.C. § 134; The Highway Beautification Program:

Outdoor Advertising Signs.

Junkyard Control.

Urban Impact Amendment: 23 U.S.C. § 128(a).

Also see "Noise" and "Utilities" below.

Case studies: Memphis—Overton Park; Miami Jetport; New Orleans Riverfront Expressway; San Antonio—Brackinridge Park.

III. OTHER ENVIRONMENTAL ISSUES

A. Noise:

1. Aircraft:

(a) Inapplicability of *ad coelum* doctrine: Northwest Airlines v. Minnesota 322 U.S. 292; United States v. Causby 328 U.S. 256.

(b) But possibility of "takings" near airports: Low overflights: Griggs v. Allegheny County, 369 U.S. 84; Lateral flights: Thornburg v. Port of Portland 376 P. 2d 100; compare Martin v. Port of Seattle, 391 P. 2d 540.

(c) "Legalized nuisance" doctrine: Background of railroad cases (e.g., Bowman v. Pennsylvania R.R. Co., 30 N.S.L. 235; Richards v. Washington Terminal 233 U.S. 546), possible application to aircraft, Fitch v. United States (U.S.D.C. Kan. 1957)

(d) Federal regulation: Public Law 90–41, provides for regulations for control and abatement of aircraft noise and sonic boom: FAA certification procedures and noise standards, parts 21 and 36 of Title 14 C.F.R.: Content of regulation; Disavowal of pre-emption; Unresolved issues re: V/STOL, SST, Retrofit.

(e) State and local regulation: Port of New York Authority; Heathrow.

2. Non-aircraft noise: California; Cities (e.g., Milwaukee, Beverly Hills); Foreign experience (e.g., Switzerland, Britain).

B. Utilities: Survey of factors considered in the regulation of plant siting; Air pollution; Water pollution; Radioactivity; Appearance; Radiation issues; The thermal effects issues; Transmission lines:

DOT's PPM 30–4.1, re use of highway rights of way.

FPC guidelines, 18 CFR Part 2, § 157.14(a).

C. Toxic and other hazardous materials: Radiation regulation; Gas and oil pipelines (e.g., Natural Gas Pipeline Safety Act of 1968); Transportation of chemicals, e.g., Transportation of Explosives Act, 18 U.S.C. 831–835, Hazardous Cargo Act (46 U.S.C. 375, 416,170).

IV. PUBLIC PARTICIPATION

A. In the administrative process: Pre-hearing participation in highway corridor selection and design under PPM 20–8 (23 CFR Appendix A); Highway hearing requirements under 23 U.S.C. § 128 and PPM 20–8.

B. Through litigation:

1. Issues of "standing": Cover generally discussions in Jaffe, ***Standing to Secure Judicial Review***, 74 Harv. L. Rev. 1265 and 75 Harv. L. Rev. 255,302; Davis, ***Standing: Taxpayers and Others***, 35 Chi. L. Rev. 601; and Berger, ***Standing to Sue in Public Actions***, 78 Yale L. J. 816; Flast v. Cohen (392 U.S. 83) distinction on non-constitutional (non-specific-clause) issue; "Public action" proceedings by individuals under state law; Compare English background in use of certiorari, prohibition and quo warranto by "strangers" to challenge administrative actions; Effect of Section 702 of Administrative Procedure Act; Sufficiency of interest: compare McGowan v. Maryland, Baker v. Carr, Harper v. Virginia Board of Electors, Harrison-Halsted Community Group Inc. v. Housing and Home Finance Agency, Nashville I–40 Steering Committee v. Ellington, Scenic Hudson Preservation Conference v. FPC, Citizens' Committee for the Hudson Valley v. Volpe.

2. Effect of state substantive law on rights at issue (e.g., state riparian rights doctrine; nuisance doctrine)

3. Effect of federal law on substantive rights at issue. (Return to discussion of effects of National Environmental Policy Act of 1969.)

4. Limitations and insurance of liability: Review oil pollution materials; Absolute liability proposals in connection with transportation of hazardous materials; Nuclear hazards:

Price-Anderson Act.

International conventions.

Mr. FISHER. Now, one might say, "Why are lawyers always getting into the act?"

The answer I think is stated much more eloquently by the prior witness than I could ever dream of saying it. When he talked of the necessity of an ecological revolution requiring the orientation of a policy-making process in this country, and in a sense of relying on the extraordinary inventiveness of the American industrial system to provide the road to ecological invention, he means the ecological point of view has to be fed into the total process of the American industrial system, and where that system in some cases is hit by Government regulation, the ecological balance has to be taken into account as a part of that regulation, just like other factors are, and I think this has generally been recognized, and I think it was this sort of assumption that underlay the present ambulatory reference in the National Environmental Policy Act of 1968.

Of course, I am speaking generally and the detailed outline which I am submitting for the record will cover the other view provided by that act, and raise the questions as to whether or not that act itself with its congressional findings puts a new dimension to the various regulatory schemes that call for public interest, necessity and convenience.

This is a congressional indication when you are dealing with the public interest and convenience, but you do not take the ecological balance specifically into consideration.

The course will also deal with the issue of whether or not the present gives the individual greater legal standing than the courts have recognized up to date, and will go through the various forms of environmental controls now in effect, the public lands, wildlife, pollution, water pollution as well as air pollution, oil pollution, and in particular the problems of waste disposal and perhaps Federal impact programs. It will also deal with the problem of noise which will become recognized with the environmental problem.

One of the reasons I would not like to submit this here, is, frankly, is that the present outline is a little too legal for me. It is not quite disciplinary enough, and maybe that is all we are thinking about right now is a seminar, just because at a later period, if the problems that go into those law schools, considerations being worked out, we might have a full-fledged course, and perhaps given to no less than a full-time member of the faculty.

Now, in terms, you see, in view of our interest, we completely support, or I certainly do, the purposes of the bill.

I have one rather small perhaps, "nit pick," which seems lawyers seem to be looking just ahead of their own feet, and not seeing the stars, and that is to the extent that we see in one reading of the bill, is the impression that the primary interest of the bill was in the type of public education, set forth again, eloquently, in page 8 of the previous witness, Dr. Osman's statement, that you are educating people to the importance of environment, so they in a sense will demand it, and he mentioned the board of directors of large corporations, and then he added government officials.

Well, this is fine. I think that is great. I think, however, some education as to the basic public affairs role of it probably should be included, and I do not believe the law schools generally would be terribly unhappy, if on page 3 of the bill, line 18, that graduate were put in between college and adult education, graduate professional.

If it is clearly the intent of the bill to do that, why, the legislation of the draft speaks for itself, and I would hope so, and I would so construe it after listening to the previous witness.

That is really all I have to say, Mr. Chairman, other than to say that I strongly support this bill as making it possible for the Association of American Law Schools to deal with the really very social problem that all of a sudden we have with us.

We have been dealing with it in bits and pieces, but all of a sudden, here it is at our doorstep, and looking at it as the total environmental balance seems to me to be long overdue.

Mr. BRADEMAS. Thank you very much for a most helpful statement, Mr. Fisher.

I was interested in your telling us there are about a hundred courses in ecology in the American law schools at the present time.

Do you find from your own experience as a law school dean, that your incoming students are demonstrating more interest in and demand more courses along these lines, and that it is also the judgment made by the administrators and faculties of the law schools?

Mr. Fisher. Well, there is happily, and I say happily, because it is not always thus, there is happily both.

This is happily a case where the judgment of the administration and faculty at the law schools and the general design of the student body tend to coincide, and the students, while they occasionally characterize themselves by terms of being activists, nevertheless, when you talk to most of them, they are activists in regard to a desire to work within the system, and to say that the American Constitution and legislative structure provides the means of dealing with the problems that our great progress has created, and that is what I believe "activism" is in the best sense of the word.

Mr. Brademas. I notice, like at the University of Notre Dame, some law students same to talk to me on how they might make some contacts here in Washington, to move into the field of what they might call environmental law.

I take it they had in mind in particular the effort which seems, I judged, by some news stories to be growing across the United States, to move into fields, a field in which they could help bring law suits against polluting industries.

Do you find that this is a cause, as it were, to which more and more law students are beginning to pay attention, or not?

Mr. Fisher. Well, you do not bring suits just for that purpose. You bring suits for a basic legal purpose. I find that more and more law students would like, not themselves to bring law suits, but, with the possibility of freedom of information suits. I find they would like to work on this sort of thing in connection with suits that arise with the increasing legal protection being given to the environment, and a fact is that it gets increasingly recognized in such statements all the time, and that they are increasingly dealing with these matters, either before administrative bodies and in the course——

Mr. Brademas. One of the principal problems to which the report was entered into the White House last fall is the matter is disciplinary courses. Do you have anything to say on that?

Mr. Fisher. Well, I think dealing with this problem, on just a strictly law book basis is very unreal. We, for example, do have multidisciplinary courses given in one case given by a doctor. We have multidisciplinary courses in the field of evidence in the criminal law field, given by experts and material tracing and things of that kind. Also, we also find a great increase in multidisciplinary courses spanning law and the social sciences.

Now, I am aware that during my previous job, having been active in this interdisciplinary area, it requires a great deal of self-discipline to do it, since each discipline gets so interested in the other disciplines, and one does not stick to his own, and you intend to go to—well, let me say that I remember once that we were considering the test ban, and a scientist and I were working together on it, and I suggested, I was counting earthquakes that might not be nuclear tests, and he was counting Senators that might or might not vote for the treaty, and there is a little danger of that, and if one is aware of the dangers, and aware that some of the overlapping is essential, and as long as one is aware of that, I think an interdisciplinary approach there is very good.

If we were to put in a course, to put this on a course basis rather than a part-time seminar, which I would hope we could do, this has to be put into the statement of law school budgets which have the problems of any other budgets, but I would hope to do it on an interdisciplinary basis, and physical scientists would be participating in it.

We could say we know a lot about the problem of the photosynthesis and the carbon dioxide reaction that is so essential. We keep the plants alive, and the plants keep us alive, but when I say that, I have just about said most that I know about it, and I would rather have someone whose knowledge is a little deeper than mine, teaching for us.

Mr. BRADEMAS. I just have one other question.

Will you tell me if efforts are underway to codify at State, local, and Federal level of what we might call environmental law?

I am not a lawyer and that, therefore, might not be an intelligent question.

Mr. FISHER. What this may well do is not have codifying in the sense of a word, but codify means a reenactment of a code, but I believe that efforts are underway by some of the private services to codify in the sense that there is one place you can go and have a compilation of facts, and that seems to me the way to approach this.

They are private organizations, such as the Bureau of National Affairs, Inc., and others of that kind, and this seems to me to be an area where compilation seems to be the very definite order of the day.

Mr. CARDOZO [Michael H. Cardozo, executive director, Association of American Law Schools]. There is a center at the Law School of the University of Pittsburgh that has been putting all of the laws of the States on a computer tape, and they have done this specifically for the environmental field, so that you can now find through this computer all of the laws now on the books, and to come out in the future, and that deals with this particular field.

Mr. BRADEMAS. Is there is a journal of environmental law?

Mr. FISHER. I am not aware of any. It is a logical one to take place, and to have a service on, because there are developments, and it is just not done.

There will be cases coming out, regulations to come out, and the whole problem is to knock off thermal pollution, and this is something before the AEC, and I think it is a good area for compilation.

Mr. CARDOZO. It could be a good subject for those responsible to possibly get up a uniform law for the states, which is another procedure which is quite common.

Mr. BRADEMAS. Thank you very much. Mr. Hansen.

Mr. HANSEN. Thank you, Mr. Chairman.

Let me join our Chairman in expressing to you a warm welcome and our appreciation for your coming to assist us in this legislation.

You are a person with such a wide range of areas, and you have rendered such distinguished service, that it tempts me to question you on many subjects.

I will resist the temptation.

What about the possibility of a restatement of law in this environmental area, is there something you could extract from the decisions and incorporate into a restatement along with the other areas in the restatement series?

Mr. FISHER. Mr. Hansen, I think this is undoubtedly an area where the American Law Institute could move into. They have shown a great deal of flexibilities in getting away from the typical, the old fashioned restatement that they had, like the Restatement of Contracts that Mr. Williston wrote, and since I took his course, we all studied very hard to pass law school.

They might use such things as, perhaps, a model state law. They could also use such things as perhaps recommended for the Federal legislation as they have done.

It seems to me that the American Law Institute, while it differs in its composition somewhat from the Association of American Law Schools, as far as scholarly compilation of these matters, it is a very, very good body to deal with, and I know they would be interested in the views of this committee, and in deciding something that may wish to undertake.

I could discuss it with them, with complete objectivity, since I have worked on one restaurant, and one per career I think it is about enough, but I could recommend it for somebody else.

The format is a good format, Mr. Hansen.

Mr. HANSEN. You mentioned that many of the law schools are now including environmental law courses in their curriculum.

I am wondering if it is appropriate, or perhaps this is already being done, that the content of other traditional courses can be re-examined, to determine to the extent to which an environmental component might be included.

In my own State, the mining law is an important area of the law. Water law, natural resources, and, of course, the property law, seem to be directly related to some of these environmental considerations.

Mr. FISHER. I think they will be. In fact, this is increasingly happening now.

For example, I cannot imagine a course in administrative law even dealing with broad public interest, convenience and necessity, not taking into account the problems of the Federal Power Commission, which is with the problem of thermal pollution, so I think there is an interest now in the sense of the whole ball of wax, and I think you end up by doing both.

I think this is happening with the traditional courses. While the law schools in the East were not advanced as the law schools in the West in dealing with the problem of water law, because they are awakening up to the fact that even in the East the water resources are not unlimited, and we can take a real lesson from the book of our western colleges, who dealt with that problem, maybe because they had to.

Mr. HANSEN. I will take advantage of your considerable experience in the area of foreign affairs to ask my final question.

It is obvious of course that our concern for the quality of the environment must be a worldwide concern. Unless we maintain a livable quality, and will support life all over the planet, it is not going to support life anywhere. This suggests the importance of developing an international approach, and international agreements, and cooperative arrangements. What mechanism is in existence now, or should be devised, to serve the purpose of achieving this international cooperation?

Mr. FISHER. Well, I would say probably any appropriate committee of probably the United Nations, and tiresome as can be in sitting through them, it is the best we have got.

There is an appropriate committee of the United Nations now, dealing with the problem of resources. I would assume that an agreement that might be forthcoming with that committee would deal with the problem of politics, for it to be a meaningful agreement, because the resources cease to exist if they are polluted, and now the problem of air pollution generally, in regard to atomic blasts, everyone took an oath not to engage in those generally with the limited test ban, and as far as the pollution problem of it, we may be thankful on that, because the problem of radioactive fallout has been pretty well put under control, but that is not the only problem, but I think as a matter of it internationally, I would think focusing on the sea beds, but not the sea bed exclusively, but the entire resources of the sea is probably an area where there is an urgent need which exists on an international basis, and where public interests are.

Mr. Cardozo. A professor of international law has filed an application with the National Science Foundation for support for a project studying the way in which the international community can look into this problem.

Mr. Brademas. I have one other observation on which you might want to make further comment. From your experience in serving the Federal Government, from your important position in foreign affairs, I wonder to what extent, since we are urging that the lawyers and mayors and the county commissioners and schoolteachers and everybody else—I made a speech out in St. Louis Sunday night to a group of my fellow United Methodist friends on the pressing problem of ecology—but the question is, to what extent do such agencies of the Federal Government, such as the Department of Defense, the Atomic Energy Commission, the Army Engineers, to what extent are they aware even of the concept of ecology, as they press their various programs?

Mr. Fisher. I really cannot speak to the departments of Government, the Department of Defense and the Engineers, but I think the Atomic Energy Commission is aware of it.

Now, I think they tend a little bit too scientifically, to look at the problem of radioactivity, or as pollution on the environmental basis, and I can say that the Atomic Energy Commission has been for a long period of time on the verge of an economic break-even point. In other words, the atomic revolution was announced in 1948, and it is now coming through the back door, and no one knows it is arriving, but they tend to cut corners a little bit sometimes on this sort of factor, because they are so interested in bringing the atom into the mainstream of he American economy, and I think they should be.

You have a particularly difficult problem with respect to atomic energy, because that great new facility, the reactor, producing power, produces a terribly polluted product, but this is fortunately sufficiently small that it can be contained, but where it will not be, then it can be isolated, but they have to proceed with the greatest care as far as ecology is concerned, or, if not, this great revolution and power source that we see around us will be a very apparent problem indeed, and it will be awful.

Mr. Brademas. Your example is fine. I think it is right on target.

There has been mentioned many times the relationship of economic growth on the one hand and pollution on the other, and which Mr.

Osman addressed himself to, and insofar as private industry is concerned, I am just expressing the observation, without having any serious expertise in this field at all, that the various misoriented agencies of our Federal Government, they must take into account not only the achievements, but also the impact on the ecology of the country, and they are certainly responsible for administering to these problems, and it is certainly a gigantic order.

Mr. Fisher. Well, it seems to be brought home to the Atomic Energy Commission.

In regard to thermal pollution, the Atomic Energy Commission seems to understand it, and it is not just limited to the nuclear reactor.

Anytime you are producing electricity by steam, you have a heat differential, and something has to carry off the heat differential, particularly if you have it going around.

The heat differential just seems to be a little higher than the heat differential of electricity, and that is, of course, in the nuclear reactor, in the nuclear fuel power cell, so the problem of thermal pollution is just bigger, and I cannot say they are not aware of it, because interested citizens make them aware of it quite regularly.

Mr. Brademas. I was glad to see my final point about 2 or 3 weeks ago, the Army Engineers held their first public seminar on ecology, which tells you a lot about the Army Engineers.

You have been very helpful, Mr. Fisher, and my colleagues and I are very grateful to you for coming.

This hearing is adjourned.

(Whereupon, at 12:30 p.m., the subcommittee was adjourned, subject to call of the Chair.)

ENVIRONMENTAL QUALITY EDUCATION ACT

FRIDAY, APRIL 24, 1970

House of Representatives,
Select Subcommittee on Education,
Committee on Education and Labor,
New York, N.Y.

The subcommittee met at 9:30 a.m., pursuant to recess, in room 305, Federal Building, 26 Federal Plaza, New York, N.Y., Hon James H. Scheuer presiding.

Present: Representatives Scheuer and Reid.

Staff members present: Arlene Horowitz, majority staff assistant; Will Henderson, assistant minority clerk.

Mr. Scheuer. The Select Subcommittee on Education will come to order.

We are very happy to have as our first witness this morning on the Environmental Quality Education Act the newly elected borough president of the Bronx, Robert Abrams, who is the youngest borough president I think in the history of the city, and certainly one of the outstanding public officials who has come out of the ranks of the democratic reform movement.

He's been a friend and a colleague of mine since 1964, when we both ran together successfully and I am delighted to welcome you here today, Robert.

STATEMENT OF HON. ROBERT ABRAMS, BRONX BOROUGH PRESIDENT

Mr. Abrams. Thank you very much, Congressman Scheuer.

Mr. Scheuer. We have just had a spate of oratory about the problems of earth, problems of man; we have all been bathed in a great deal of emotional glow 48 hours ago.

I am sure for many of the great polluters of our Nation this was a marvelous catharsis through which they could momentarily shed their sins, get absolution from their sins and continue sinning, if not on the same scale, on an even larger scale, and I was interested to watch on the "Today Show" yesterday some institutional advertising from some of our great environmental polluters, indicating that they are willing to spend very large sums on institutional advertising, but not very much money on redesigning their product so it can be effectively recycled and so it can effectively be less of a blight on our landscape, on our cities.

So I hope that you, in addition to whatever else you are going to tell us, will give us some insight as the political leader you are on how we can not only sustain the spirit of Earth Day but put some teeth into the sentiments and the pretentions and the generalized goals which we hear from all points on the compass.

So without further ado I wish to welcome you. We are keenly interested in what you are going to say and at this time I would like to turn the podium over to Congressman Reid of Westchester who has joined me originally in supporting this bill, who has been a very keen supporter of the environment, has provided great leadership in every aspect of environment and ecological reform and a stalwart supporter of the kinds of things you and I believe in.

Mr. Reid. Thank you, Mr. Chairman.

We are glad to welcome you here this morning and very anxious to get your views on this particular bill.

We are happy you could be with us.

Mr. Abrams. Thank you both, Congressman Scheuer.

(Prepared statement of Hon. Robert Abrams follows:)

PREPARED STATEMENT OF BRONX BOROUGH PRESIDENT ROBERT ABRAMS

Congressman Scheuer, Distinguished Members of Congress, Ladies and Gentlemen: I was proud to announce earlier this week, in conjunction with the Wave Hill Center For Environmental Studies, Riverdale, The Bronx, the establishment of an "Environmental Situation Room" to be located in the office of the Bronx Borough President. It is my understanding that this Environmental Situation Room will be the first comprehensive environment monitoring station in the United States. The central purpose of the Environment Situation Room is to publicly pinpoint polluters and other violators of the environment and to officially report instances of abuse to appropriate government authorities.

The Situation Room will be manned by volunteers under the supervision of professional ecologists who will chart on a giant map of The Bronx every instance of environmental abuse reported via a special phone number. Reports will be made by teams of "Environment Monitors" presently being recruited from college campuses in The Bronx; members of the public at large will also be able to make reports.

Although it is much too early to offer a meaningful evaluation, I have every expectation that this effort will have its major impact with respect to its community education aspect. As members of the public begin to look at their surroundings with an eye towards identifying environmental abuses—and as they are apprised of the findings of this unit—I am sure that they will be disturbed and even alarmed. But we will all be the better for it. Once the people in my community become aware of the extent of environmental abuse and its devastating effect on their lives and their physical surroundings, I am confident they will support much stronger public action against polluters, both private and corporate. Aroused public support will significantly advance the fight to push back the rising tide of filth and pollution that is today engulfing our nation.

Yet the impact of the Environmental Situation Room will be insufficient. In this as in so many other undertakings Federal aid is instrumental in making the effort effective. I am here testifying today because I believe that this kind of community awareness program falls within the general scope of your inquiry into environmental education. I propose that in conjunction with any formal education programs that the United States Congress might initiate at the secondary and higher levels of schooling, you might consider a combined program wherein students can earn credits and money by staffing Environmental Situation Rooms in localities across the country, or by serving as members of "Environment Monitor Teams" which report to the Situation Rooms.

The Federal Government could make a real impact on environmental abuse if it thus were to help local communities throughout the nation to a) identify their problem, b) publicize their problem, and c) train young people to combat environmental abuse while engaging in practical environmental abuse control projects.

The program that I will help to launch in the City University system of New York City on May 2nd involves a cooperative environment studies project between Richmond Community College and Lehman College in The Bronx, the former to establish a water pollution research laboratory and field operation and the latter to establish an air pollution research laboratory and field study program. I propose to help the City University proceed to fashion a broad program of study in which young men and women are granted degrees in various subdisciplines of ecology. The program would emphasize the identification of various kinds of pollutants and the evaluation of their costs and disadvantages to the city and to the society at large; the study of the political problems that inevitably will have to be faced when introducing no-nonsense conservation program, and the economic problems inherent in a major public and industrial committment to curtailing environmental abuse. The formal education program I envision would include the training of as many teachers as possible in the subject of ecology, and the teaching of ecological problems to as many other teachers as possible so as to impart at least a passing knowledge of the problem to those who are responsible for the general education of our youth.

Finally, I would be remiss if I did not criticize the pitifully inadequate level of Federal spending on environment *action* programs. It is essential that we strengthen our educational efforts but this will be for naught if we are unprepared as a nation to make an ultimate committment to concrete action. The President has recommended a program of $10 billion dollars over the next five years; but he has asked that the states put up 60% of the cost. The Federal Government's total air and water pollution control program has been well under a billion dollars per year for the past several fiscal years, and proposed levels of spending are just now reaching the billion dollar mark. I must wholeheartedly agree with Senator Nelson's statement that we should be spending the kind of money on cleaning up our dangerously deteriorating environment that we are able to so readily spend on war in Southeast Asia. New York City is awash with filth and plagued with more and more alarming air pollution. Let's rebuild our own backyards instead of destroying other peoples'.

"I appreciate this opportunity to testify and I hope that you gentlemen will be able to convince your colleagues in Washington of the critical nature of the problem and of the urgent need to allocate appropriate public resource to meet the challenge. Thank you."

Mr. SCHEUER. Thank you Borough President Abrams for your most interesting testimony. I think your environmental situation rooms might well provide a model for other communities across the country and I hope to see this replicated hundreds, perhaps thousands of times, and it might well be that we ought to provide some funds in our act for subsidizing perhaps several kinds of models of environmental situation rooms and ecology in universities, colleges and perhaps high schools, too, using the students as volunteer sniffers, scrutinizers and watchdogs, and I think you deserve a great deal of credit for producing a very remarkable and interesting innovative program.

Mr. ABRAMS. Thank you.

Of course it is obviously only half the problem because, once we chart and recognize the abuses of the environment, we have to have expeditious enforcement proceedings so that abuses will be penalized if they don't cease and desist.

We are hopeful in working with the City of New York Environmental Protection Administration in following up enforcement procedures.

Mr. SCHEUER. In connection with that, it is my understanding the City of New York is a major polluter and it is my understanding that many of our schools, hospitals and incineration plants operated by the city themselves fail to live up to the city's well-conceived antipollution law and the administrative regulations that have been produced under that law.

From your knowledge, No. 1, is that true and, No. 2, if it is true, how could we get governmental institutions like the city, like the Army

Corps of Engineers, like many other elements in the Federal Government, how do we get Government agencies themselves to live up to the standards which we, the community, have produced through the legislative branches of Government?

Mr. Abrams. First of all, I think, to a large extent it is true, Congressman Scheuer.

Second, I don't think the Government should be immune from the sanctions and standards established by it for the public at large.

And third, the situation room may well be the device to publicly point the finger at Government if it indeed itself is a substantial violator of its own precepts, because the situation room will accept inquiry and notice from the public at large, from ordinary citizens, as to where pollution is coming from and indeed, if the city or if the Federal or the State government has a plant within a locality that is belching forth pollution into the air, then this will become a matter of public knowledge and indeed the situation room may therefore become a catalytic agent to the Government, preventing its polluting the society within the locality in which it is found.

Mr. Scheuer. You see the situation room as a means of mobilizing public opinion to, first, awareness of the problem and, second, a determination to do something about it in a way that is visible and audible and that will register political decibels?

Mr. Abrams. Right. Which won't be too high in nature, you know.

Mr. Scheuer. There are some people, including the General Counsel, Neil Fabricant, the General Counsel of the Environmental Services Administration, who believe that we shouldn't fine major polluters, but we ought to close them down.

Of course implicit here is the suggestion that the kind of fines that are administered are acceptable to them as a cost of doing business, that it doesn't stimulate them very much to make the rather substantial capital expenditures that have to be made in order to eliminate pollution.

And he feels that we have the kind of legislation whereby they will simply be closed down and be put out of business if they don't conform within a given, stated period of time.

Do you have a reaction to this?

Mr. Abrams. Well, I think this is a worthy suggestion. We do it in other instances where there is a violation of the law which endangers public health.

If an inspector comes into an establishment that serves food and there are violations that are of a serious nature, then that establishment is closed down immediately unless and until these violations are removed, and clearly we have found that emissions of pollutants into the air can cause great harm physically and psychologically to the public at large and may well be indeed cutting down our life span and causing death to some people.

We have had some of the temperature inversions around the globe in the last half dozen years which have cost lives; in London several years back it cost 4,000 lives more than the normal death rate within London for that period.

Mr. Scheuer. I think the extrapolations are that we will have very serious problems with these inversions in the Los Angeles area between 1975 and 1980 as they project the buildup in present rate of smog there, that they feel will cost tens and tens of thousands of lives in the last half of this decade.

Mr. Abrams. Yes, we had a specific example in the year 1966 in New York City where I think some 186 people lost their lives over a 24-hour period due to these temperature inversions.

So clearly we must deal in a very bold, dramatic, and effective way and, if industry is not complying, and dragging its feet, then we will have to take very stringent methods.

And one method may well be shutting them down if they don't comply.

Mr. Scheuer. I used to be in the housing industry before I was a Congressman. I am aware of an FHA practice, if an FHA developer violates any standard of the FHA if the discriminates or fails to maintain the buildings properly, they not only can penalize him on a particular building but they can deny him all future financing from the FHA.

They can put him on the gray list and in effect deny him Government benefits that they can control.

What would you think about a policy on the part of the Federal Government where, if a large industry is a polluter and is found guilty by some judicial process of polluting, that until that condition was cured the Federal Government would say, "We are not going to give you any more Federal benefits"?

Now to many businesses that enjoy all kinds of direct and indirect Federal subsidies it seems to me that would be a very, very effective sanction.

Mr. Abrams. I think these are the kinds of proposals, Congressman Scheuer, that are necessary to put teeth into the rhetoric that we have been hearing over this past week.

One of the questions raised by commentators who observed the Earth Day or Earth Week activists around the country, is this just going to be a passing fancy, was this a lot of rhetoric and, I think some have indicated, a mere catharsis for a short period of time?

And the key is whether or not we are going to follow through with legislation that is going to have great impact and the kinds of proposals that you have indicated I think are the ones which indicate a degree of seriousness and earnestness on the part of our Government to tell major industrial polluters, wherever they are and where they may be, that we mean business, that we find that we have a critical problem affecting the people of our country and we are going to take drastic steps and action to correct it.

Mr. Scheuer. Thank you very, very much.

Congressman Reid?

Mr. Reid. Borough President Abrams, I certainly want to thank you for your thoughtful testimony. I think your concept of an environmental situation room is creative and very worth studying and implementing.

I would like to ask you in the broader aspect of the problem in the Bronx, are you aware that the Federal Government has turned down New York State AEC generators for this area?

Mr. Abrams. No; I wasn't.

Mr. Reid. They have because the Federal Government has determined that the standards set by the State could constitute a danger and be not fully protective of health.

Specifically they are concerned about particulate matter in the air and sulfur dioxide levels.

What do you think can be done about some of the major polluters fairly promptly, that is to say, the internal combustion engine, lead in gasoline, the water pollution problems, that comes from failure to have tertiary plants, in some cases not even primary or secondary plants?

Our water is becoming increasingly polluted and our air is becoming dangerously saturated with particles; as you have seen, the death rate due to emphysema has increased a hundred percent in the last 10 years and Bronx County is up 200 percent.

What do you think you can do as borough president of the Bronx on this particular problem?

Mr. Abrams. First, Congressman, I find your remarks quite interesting, because clearly in New York State standards were not found to be a sufficient level by the Federal Government.

Then it underscores and highlights the magnitude of our problems because New York is alleged to be one of the forerunners of the 50 States in setting up standards, rigid ones and allegedly rigid ones for protection of the public against pollution.

So it only indicates the scope of the problem that we have.

I think as Bronx borough president there are very grave limitations within the office of dealing effectively with it because this has to be done on the legislative level, either through the city council, the State legislature, the Senate, and the Assembly of the State of New York and the Congress.

And I think the kinds of proposals Congressman Scheuer was mentioning earlier indeed are the kind that have to shake up the major polluters.

I think we have to rethink in dramatic terms the way we are moving in our society, larger and larger automobiles, high-powered engines.

Maybe we just have to think of prohibiting automobiles that go faster than 60 miles an hour. There is no earthly reason why we have to have a 325 horsepower automobile.

The speed and carnage on our highways—certainly I am a critic of war, but when one reflects that more than 50,000 people are killed every year on our highways and the total death casualty in Vietnam is 40,000, I think two and a half million people are injured every year on our highways, yet we are not doing anything about it.

Let's mandate that no automobile engine should be built that can produce a speed in excess of 60 miles an hour and don't have calibrations on the speedometers in excess of that.

And this relates to the environmental problem because I am told and I believe that, if you want a high-powered engine you must have a greater input of lead content.

Mr. Reid. What about banning lead? I have put in a bill to ban lead by a date certain.

Mr. Abrams. I think it is an admirable bill and I think it should be moved quickly because it is my understanding that the lead emission from exhaust is a major problem.

We have in the city of New York a lead poisoning problem of youngsters derived from eating of peeling paint, and we also have the problem——

Mr. Scheuer. Let me interrupt you.

This is a different problem. This is not a problem of lead being the pollutant. The problem you are addressing yourself to, the problem that the lead provides is that it prevents the antipollutant systems from working.

It itself is not a pollutant and it itself is not a problem but it prevents the antipollutant devices from cutting the other pollutants out of the air.

This is not the same kind of problem that you have in mind.

Mr. Abrams. I think it is a dual problem. I think your analysis is absolutely correct and I am also told by the citywide chairman of the committee against lead poisoning that it creates levels of lead within your body which has great physiological effect against functioning.

Mr. Reid. As a practical matter, an automobile turns out a hundred million particles per second. Every time you are vaporizing, you are smoking the lead that's in your lungs.

Doctors don't know exactly what to think about it, but today spending a day in New York is the equivalent, I am told, of smoking a package of cigarettes.

What steps can you take on your own authority as borough president of the Bronx against pollutants?

Mr. Abrams. On my own authority none other than public outcry. As I indicate, it is the legislators of the various levels that really have the power.

Mr. Reid. So you would have to get the board of estimate and the city to act?

Mr. Abrams. Yes; it's been my hope that through the environmental situation room in the borough president's office I would be able to focus attention on it and get some support of the enforcers and hope for further legislation.

Mr. Reid. Well, I thank you very much for coming. We are very interested in what you have said here.

Thank you very much.

Mr. Scheuer. Thank you very, very much.

Next I would like to question Kevin McGrath, Kevin Harvey, and Rory Callahan.

Do we have two Kevins or a Kevin and Roy?

Mr. McGrath. I am Kevin McGrath. This is Rory Callahan.

Mr. Scheuer. We are very happy to have you. Kevin McGrath, Rory Callahan, and Kevin Harvey were organizers of Earth Day ceremonies at Fordham University, at which I had the honor to be the lead speaker.

There was a very beautiful, moving ceremony on the outside steps of the main building at Fordham with many, many hundreds of students and faculty members in attendance.

I found it a very beautiful and moving occasion. I think you did a remarkable organizing job.

You showed great concern and leadership for the problems of environment, typical of college leadership across the country, and I am very happy, too, that you can be with us here today.

Congressman Reid?

Mr. Reid. I just want to thank you for being here.

STATEMENT OF KEVIN McGRATH AND RORY CALLAHAN, EARTH DAY ORGANIZERS AT FORDHAM UNIVERSITY

Mr. McGrath. I have a prepared speech.

Mr. Scheuer. Why don't we have the speech printed in full, the prepared speech, and you can comment?

Mr. McGrath. I would like very much to read it.

Mr. Scheuer. Go ahead.

Mr. McGrath. I wrote on the front of a pamphlet that was distributed at Fordham on Earth Day that the environmental crisis represented a struggle against ourselves. In Congressman Scheuer's address at Fordham he noted this statement and said that he felt it was a struggle within ourselves rather than against ourselves. I agree that it is a struggle within ourselves; but even more it is a struggle against ourselves, as I shall explain.

The root of this struggle, I feel, lies in our Judeo-Christian values, because it is these values that have shaped this Nation into the condition it is in today. These values hold that the earth is here for us to use as we see fit; the earth is just a temporary home and therefore only serves a temporary purpose. It is obvious today that we are living up to those values. We have been and are continuing to destroy the environment in hundreds, if not thousands, of ways. Just about everything modern man undertakes has some destructive effect on the environment, including the propagating of his own species. This is where the struggle within ourselves lies; our values have to change, and this is possible only through a social revolution.

At this point I would like to quote Mr. Kingman Brewster, Jr., president of Yale University, when he addressed a newspaper group this past week. Mr. Brewster said, "the malaise, the disenchantment with life and its progress, is greater now than a year ago among most American students" on college and university campuses. Students, Mr. Brewster said, "see their leaders using—the alleged complacency of 'middle America' as an excuse for evading the challenges which matter most." He reported "a widespread sense that no one in the Government Establishment is moved to urgent, controversial action."

Citing frustration over "the disparagement of dissent and nonconformity," the Yale president asserted that "potentially constructive critics, skeptics, and heretics—what I would call 'considerate radicals'—are being driven into the ranks of those engaged destructivists who would tear down the system."

Professor Wrenn of Oxford, speaking of the Anglo-Saxon tradition said that there is a "fundamental English preference for gradual rather than sudden change; for incomplete rather than consummated revolution." Mr. Brewster went on to say, "the ability of universities and newspapers to defend and utilize their freedom will have much to do with the ability of the young to keep their faith in freedom.

It is this gradual change that most concerned environmentalists are seeking. They want to keep their faith in freedom, but it is becoming increasingly difficult. "If the country does not rediscover its own sons and daughters, no amount of law and order or crisis management will make much difference in the long run."

Now I go to the struggle against ourselves. I see this as a struggle against technology, which we have created. This is a cancerous and rampant technology that is beginning to control our lives; and in so doing, it is destroying our environment. Take for example the supersonic transport, SST. It is being developed solely for national prestige; yet it alone could create environmental problems that could destroy the world. The problem with the SST, known as the greenhouse effect, could cause the upper atmosphere to become polluted. Thus the atmosphere would retain much of the sun's heat, and cause the polar caps to melt; thus flooding coastal areas. We truthfully do not know if this will happen, yet we continue on; blindly lead by technology. Will we ever learn? What about the Santa Barbara oil leak? We did not learn there. We had to have another serious oil leak in the Gulf of Mexico.

Mr. Reid. I would like to interrupt. May I say that your point on the SST is well taken.

I have called the attention of Russell Train and the President's Environmental Council to this specific point because I think we are learning that what is in the biosphere will remain there forever.

Mr. McGrath. About the ship *Torrey Canyon* as a polluter.

Mr. Scheuer. To interrupt there I think the amount of pesticides that could have been caried in a ship like the *Torrey Canyon* would have killed the fish for many, many hundreds of miles.

Mr. McGrath. It was estimated that the whole North Atlantic——

Mr. Scheuer. Yes. The entire North Atlantic, perhaps a radius of a thousand miles, would have had a devastating effect upon the ecology of that ocean body.

Mr. Callahan. I would like to add there is a plant, phytoplankton in the surface waters of the North Atlantic that provides not just 70 percent of the water there but the oxygen we breathe comes from the water there and, if a catastophe occurs there it would be like a gas effect in the Northern Hemisphere.

Mr. Scheuer. Right. Please proceed.

Mr. McGrath. What if the ship *Torrey Canyon* had been carrying pesticides instead of crude oil. Will we ever learn? These are examples of where technology has extended beyond our control; now it controls us.

But I feel that the perfect example of technology for technology's sake is in the nuclear power reactors. Supposedly these reactors represent a technological advancement, but they may represent the doom of mankind. They create radioactive wastes which there is no way of disposing of; and they create thermal pollution which destroys the ecology of our rivers and lakes.

By being built on the banks of rivers and lakes, the reactors despoil some of our most beautiful natural resources. Finally these reactors give off radiation and we are not absolutely sure how much radiation a man can absorb before he is harmed. Fossil fueled generators are far more efficient and use 50 percent less water for cooling.

Mr. SCHEUER. I hate to keep interrupting you but you are making so many significant points but some of them are implicit.

I don't want them to be lost for the record.

What you are saying is there is no way we can produce electric power, even through the use of fossil fuels, oil, gas or atomic energy, that doesn't have significant environmental fallout?

Mr. McGRATH. But some are worse than others. By far the nuclear reactors are considerably worse.

Mr. SCHEUER. Yes, but the fact is we don't know how to produce electric power through any combination of the fossil fuels that doesn't have significant environmental fallout.

So that brings us to the whole business of what we can do to control the galloping increase of electrical consumption.

Do we really need the electrical carver, hair dryer, all the gadgetries?

Is it in the public interest, for example, to give tax deductions to electric utilities who, by institutional advertising simply urge people to increase their consumption of electricity willy-nilly?

And you are pointing up some desperately important problems.

Mr. McGRATH. From what I have read and from what I have been able to understand, there aren't that many reasons why fossil fuels can't be used. They are more efficient.

They use less water. There's sufficient fossil fuels in gas, oil and coal for a few centuries.

Well, there's enough I read the other day in an advertisement, there's enough uranium with power for 17 centuries, but I don't think we are going to be around that long so it doesn't matter.

I mentioned that the Alaskan pipeline will damage the Alaskan wilderness?

This morning, if you read the papers, Mr. Hickel approved the pipeline which is going to be rather disastrous. Will we ever learn?

The Everglades represent a very important estuarine and wilderness area in Florida, yet we were going to pollute and possibly destroy it with a jetport. It was only through hard fought battles with authorities by conservationists that disaster was prevented. Yet right now oil wells are being drilled not far from the site of the proposed jetport. Will we ever learn? Lake Erie is dying or is dead; yet the New York State Legislature has recently given restricted permission to oil companies to drill there for oil. Will we ever learn?

Some people say that technology will solve these problems, it hasn't yet and it is obvious that if we can't control technology then how are we going to use it to solve the environmental crisis.

Technology, as in science fiction, is a monster which is turning upon its creator. Up to this point, post-industrial man has thought that technology is a Dr. Jekyll and it is only now that we are discovering the Dr. Hyde in its personality.

So now I return to my original point of whether it is a struggle within or against ourselves and again I conclude that it is both. We are going to have to fight on both fronts and I fear it is going to be a desperate fight for survival. It may require a social revolution, possibly a violent revolution, I sincerely hope not, but yet I see little hope. It does seem possible that technology will solve some problems, like air pollution and sewerage treatment plants, but will technology create more pollution in doing this. In fact is there anyway to escape from this monster. It is going to require sacrifice on our parts, it is going to require insight on our parts, and it is going to require research and enlightenment to the problems and solution on our parts. Education seems to be the only answer, an education to new values, an education to a new way of living; living with the environment rather than off the environment. I refuse to say that money is the answer. Americans have tried to solve all our problems in the past with money and we are in pretty sad shape right now. I caution everybody to take a very serious look at exactly what they are doing to the environment, reevaluate your way of living, we have rushed ahead in the past, we don't have much time right now but can't afford to make a mistake.

We are slowly, piece by piece, destroying the environment; we will soon, sooner than you think, have destroyed all the pieces. Possibly a few of us might survive, possibly in plexiglass habitats, but these will be like cages, technological cages.

The dodo bird is extinct—will we ever learn?
Man is headed for extinction—will we ever learn?

(Remainder of Mr. McGrath's statement follows:)

SECTION II

There is no getting out of it. Our world is infected with quantity. As was previously noted the cards seemed to be stacked against us. The only way that we may approach a solution is by getting to the root of the problem which is the average person—the consumer who eventually becomes the disposer. A most effective way to reach this consumer is through the school system. We now desperately need a vast change of values with regard to our environment. This goal can be achieved best by the development of courses which emphasize the impact man actually inflicts upon his surroundings. I have no easy formula for the education of such students. To be effective it should renew the sense of belonging to the world of nature as revealed by science. To this goal I have experienced the value of laboratories out-of-doors as well as within walls. In scientific training (even on the simplest plane), the first thing to do with an idea is to prove it. This could best be achieved by field trips to scenes of natural beauty or of ecological disaster. Fortunately this method is feasible for both urban and country schools. The basic facts of the ecological balance of nature and the role that man plays in it must be made mandatory for all.

Various levels of intensification in the study of the environment must be established. For the reasoning behind this idea I believe that there is room for the generalist as well as for the fact-supplying specialist. Ecology need not only be looked upon as a child of the biological sciences because a true understanding of one's environment requires a knowledge of other fields ranging from Political Science to Anthropology, from Chemistry to Architecture. Therefore if education is to keep abreast of this multifaceted ecology, work must begin immediately at all levels or the predictions for our Earth may very well come true sooner than we think.

Mr. SCHEUER. Thank you very much. That was a very beautiful and moving piece of testimony and I congratulate you on it.

Would you like to comment?

Mr. CALLAHAN. The only point I would like to say, Kevin made a point about education.

I refer to *The Environmental Handbook*, edited by Garrett de Bell. Some of the points were really interesting, how the main thing to do is to have an educated voter at this point if we are still going to be working within legislative bounds.

Mr. SCHEUER. That's what this legislation we are considering this morning is all about.

Mr. Callahan. Yes.

I was wondering, like the main point that should be brought out is the fact that a year ago, speaking for myself, I didn't have the slightest idea about this.

I am a philosophy major, not a science major, and it has to be brought out, you know, from primary school on up through adult.

Mr. Scheuer. Pre-school.

Mr. Callahan. Pre-school, right up through the selling clubs and it is just the ruin of the consumer.

Industry has to be, you know, sort of corralled, but at the same time I think it is the law of supply and demand.

If they could really get at the root involved, the consumer becomes the disposer.

Mr. Scheuer. I believe we need the ecologists who are philosophers perhaps more than ecologists who are just scientists.

The point you are both raising, I think you proved to my satisfaction, Kevin, that we don't have a difference.

When you pointed to the Judeo-Christian ethic, as perhaps the basis of our problem, you simply illustrated my point that it is a fight within ourselves as to what kind of people we want to be, what kind of a lifestyle do we want to have, what is our concept of reality, what is our concept of the relation of each human being to living things.

Mr. McGrath. Are we going to be able to change that through the system now?

Mr. Reid. If my colleague will yield, I think what we are talking about is the 18-year-old vote with a new set of values and priorities.

I think we need an environmental ethic and I think we need to recall what Thoreau wrote in Waldon, "Most of the luxuries and many of the so-called comforts of life are not only indispensable, but positive hindrances to the elevation of mankind."

The question is: Do we want phosphates in detergents or are we willing to have slightly less clean dishes and use elbow grease?

Mr. Scheuer. Produce dust-clean dishes.

Mr. Reid. That's right.

We are still spending more on highways than on education. We are paying Congressmen and others not to grow food in a country where we have about 10 million, many of them children, with serious malnutrition problems, and at the hunger line.

Many of the values that you have put your finger on are relevant.

Mr. McGrath. But you still haven't answered my question whether the system is going to deal with it.

I don't think it will.

Mr. Reid. I am an optimist. I think the genius of America is that we can change.

We change slowly, and I think we've got to change quite quickly in certain areas.

I think it is shown in this area and other primary areas. You may have seen the tone change from Montgomery to Memphis; Dr. Martin Luther King proved we can change our pattern in voting rapidly.

And the quotation you mentioned, Kevin, of Kingman Brewster of Yale is very apropos.

There are not enough men in public life either gripped with a sense of urgency or willing to take on controversial and bold approaches commensurate with the need.

But I think if you speak out and others speak out, you will see that this increasingly will become possible and a reality.

Mr. **McGrath**. But there was an outcry against the Alaskan pipeline. A huge article in the *New York Times* Magazine. You can't get much more influential than that.

Hickel went right ahead? Where is the justice? You can't see the justice.

Mr. **Reid**. Let me just add one point and I will yield to my colleague.

I think one of the problems is you don't win every endeavor. The question is whether Americans will cop out when we have a few defeats. I think the test is whether we will be able to stay with it until we get enough people in public life who are making the right kinds of decisions and care about the values and make the decisions on the environment we are talking about.

I think we can get enough people. It may not be overnight.

The largest temptation is to cop out but the toughest thing is to stay with it.

Mr. **McGrath**. I feel the same. It is not going to accomplish anything to cop out. But at the rate we are going right now, I think we are going too fast even to catch up with it and we are going to continue to go even faster and there doesn't seem to be any way to stop it.

You are talking about passing legislation to stop auto pollution by 1975; 1975, you know, could be three times as worse in New York City.

Mr. **Reid**. You are correct and that is why I have used the sense of urgency several times. I think there are areas that will be uninhabitable in 10 years, according to certain scientists who have talked to me.

So I think it isn't solely a question of change or priorities or ethics. I think you are correct. We have to move with a much higher degree of speed than in the past.

Mr. **McGrath**. Do you feel that the system now will be able to do it?

Mr. **Reid**. It won't at the moment, but I think it is possible to make significant political changes in quite a short period of time and that's part of the task, to make a political system that's responsible within the time frame we have left.

I was asked by the students at Makerere University in Kampala, Uganda, a while back whether there was any hope for liberals in America and I said there wasn't any guarantee that some of us would succeed in the things that we were hoping for but there was a guarantee we were going to try.

Mr. **Scheuer**. I think if you look around the environmental and ecological landscape, you will see some success and some failures.

Mr. **McGrath**. I agree.

Mr. **Scheuer**. We stopped Con Edison at Storm King. We had a precedent-setting decision by Prof. Paul R. Hayes, who said that the regulatory agencies couldn't just sit there as at a tennis match watching the ball go back and forth, but had to actively intervene to protect the interests of the public.

This is a new concept.

You mentioned the business of the Everglades. That was a terrific victory for the consumer interests and the environmental interests, the ecological interests, for student leaders like yourselves who mobilized public opinion.

It showed it could be done. Now a Federal court—was it a Federal court who stopped this Alaska pipeline or was it the regulatory?

Mr. REID. That was a court that stopped——

Mr. SCHEUER. The Federal court enjoined. Hickel said this morning he's going ahead with certain safeguards, he's been assured by experts, et cetera, et cetera.

If he can't come up with safeguards that make sense, there can again be a suit in Federal court to enjoin him from going ahead on the grounds he hasn't taken reasonable and adequate precautions to protect the environment and ecology.

I would like to turn this question back to you. You asked if society can make it. I think with students with your knowledge and your emotional drive and moral commitment, I believe that's not only the hope but I think that's ultimately the assurance that the system can work.

You aren't being closed out. You have two Members of Congress

You aren't being closed out. You have two Members of Congress here who have been elected by their constituents to sit on important committees; they happen to sit on committees that pass 40 percent of the total output of Congress, excluding private immigration bills. Is that correct, Congressman Reid?

Mr. REID. Yes; that's correct.

Mr. SCHEUER. Your words are being printed here and they will be examined by other Members of Congress and in effect you are impacting the system, and people 48 hours ago were listening to you all across the United States.

It seems to me your challenge as leaders—and I am not even going to use the term student leaders—you are citizen leaders and you've got more brains and more knowledge than most people two or three times your age who call themselves citizen leaders—it seems to me you have the challenge of maintaining the momentum that was built up 48 hours ago of making sure that our major environmental polluters—the automoblie companies who produce 10 million products a year that are polluting our atmosphere, the utilities that are polluting our atmosphere, the great industrial polluters who are polluting our streams—it is up to you to make sure these guys don't get away with their pollution by buying a little advertising time as they did yesterday on the "Today Show."

Mr. REID. I hope, if I may interrupt, that you will get the students at Fordham to back Campaign GM, to get concerned people on the board of GM and get decisions in the interest of the public.

Mr. SCHEUER. I am working with President Pusey of Harvard University for the same thing. You gentlemen ought to be working with the trustees of Fordham University. I am sure they own some stock.

You ought to be working with them to make sure they, along with the trustees of Yale and Harvard, put representatives of the public interest on their board.

I think the buck is settling right by you two gentlemen. I think you have a clear challenge to maintain the integrity of what we started 2 days ago.

You have a challenge not to let it degenrate into a lot of sanctimonious platitudes, to provide a cover-up for continuing pollution by the polluters, with the only price they have to pay being a little institutional advertising on the Today Show.

So I would like to ask you what you think you can do and what you think we can do to make sure the terrific mobilization of concern of 48 hours ago doesn't just dribble away into an exercise in futility to the point where it actually turns off young leaders like yourselves.

How do we build on it? How do we involve more people in significant action programs that have an impact locally, that actually dent polluters, reward the ones who change their way of doing business and punish and get out of business those that aren't willing to shape up?

In other words, how do we use the momentum we build up to get the major polluters in our society to shape up or shipout?

Mr. REID. If my colleagues will yield, I would just like to thank Kevin McGrath and Roy Callahan for your testimony. I have an appointment up town, unfortunately, but I do want to thank you for your leadership in coming here this morning.

Mr. SCHEUER. Thank you very much.

Mr. MCGRATH. Thank you very much.

Mr. SCHEUER. What do you think we ought to do on this side of the table and what do you think is the role for citizen leaders like yourself?

Mr. MCGRATH. I would like to go to a specific example like SST. There was an advertisement I believe by F.O.E., Friends of Earth.

Mr. SCHEUER. I have worked very closely with them.

Mr. MCGRATH. F.O.E. had an advertisement in the *New York Times* with some clippings in the top, in which one was sent to the President. I received a response, a nice printed letter; but it was an effort on my part.

And from everyone we have spoken to—we have had several speakers at Fordham—they say the only way you can work through the system is through the agency and by writing to your Congressman and here I am speaking to Congressmen.

I am saying I have written. Now what are you going to do to prevent the SST? As I have already stated, there's a possibility that the effects from it alone will destroy the world.

Now I am passing the buck back to you again.

Mr. SCHEUER. Well, let me suggest the kind of things I think you could do.

It is true that you can effect through your actions, national legislation and national decisionmaking.

If you make things hot enough for your local Congressman, the four Congressmen in the Bronx, and you hold their feet to the fire, you can get them to vote your way on environmental issues, because they know you are going to reward them if they work with you and they know you are going to help destroy them if they work against you, and, believe me, this is something that Members of Congress understand, "If you help us we are going to help you. If you ignore us we are going to help destroy you."

So, a high degree of political activism is an indispensable concomitant of what you are trying to do; No. 1, you have to help your friends in politics if you want to be successful.

No. 2, on the kind of issue we are talking about, General Motors, I would be willing to bet dollars to doughnuts that Fordham University through its endowment is an investor in some of the major environmental polluters in the country.

If you haven't started this, you can write your board of trustees, give them a list of the dozen major environmental polluters, Con Edison, General Motors, major industrial polluters, ask them if they own stock in these corporations and ask them what they are doing as shartholders to bring some kind of public responsibility in the private corporate decisionmaking.

The students at Harvard are doing that. They are working with President Pusey, and I think you can write to the students at Harvard and find out how they are doing it.

Mr. McGrath. I assure you the Fordham students will be doing it.

Mr. Scheuer. Next, maybe the Fordham students and the New York University members in the Bronx could get together to provide a snoopers' council to [illegible] apartment that is pouring smog into the area.

This can be done visually. Once you have identified them, you can write them, you can go down and see the environmental services administrator at city hall. You can picket them, go and see the borough president—you can make things uncomfortable if they don't shape up.

I think you can have a major influence right here in the Bronx by doing the leg work and identifying the polluters and then using the students at your campus to meet with the authorities, with the managers.

If a responsible group of students asks to meet with a president of a store or an owner of an apartment house and they will meet with you—if they don't the first time, they will meet with you the second—if you do that—I hope you will do that.

Let me get back to the very first thing you discussed, the Judeo-Christian ethic.

We have had several churchmen, spiritual leaders, Catholic, Protestant, Jewish appear before us and they all went on to explain that the word "dominion" in the Bible, "Man to have dominion of the planet and all living things," as it has been treated over the centuries, implies trusteeship, the concept of trusteeship, concept of responsibility, of love, and that it doesn't give a license for ruthless exploitation and wanton despoilation, but implicit in the Judeo-Christian ethic and the word "dominion," which does appear in the Bible are the qualities of heart and soul and concern for one's fellowman and concern for living things that give us the kind of environmental ethic flowing out of the Bible that you perhaps would draw up yourself.

And I will send you the testimony that these men have given us and I think you will very much enjoy reading it and you will find that the Judeo-Christian ethic, as interpreted by scholarly church officials gives us no license whatsoever for the kind of wanton destruction of the environment that is taking place, and in fact our deepest and most dearly held religious figures give every religious foundation to the kind of thoughtful and sensitive environmental ethic you are proposing yourself.

Mr. McGrath. Can I ask you one question? You asked me what I plan to do about General Motors and whether Fordham owns stock and things like that.

Now I have mentioned the SST. I have mentioned—let's see—I mentioned oil wells in the Everglades after some organizations have just gotten through fighting a tremendous legal battle to remove, to try to prevent the project coming in.

There's the oil wells, the Alaskan pipeline stopped right now.

Mr. Scheuer. This is just in today's paper.

I think you have to give these groups a chance to mobilize and get cracking.

We are not going to win them all, but we are not going to lose them all. Whether we win more than we lose I think is up to people like you.

Just yesterday I flew back to Washington to have a chance to vote against the space program.

I am in favor of learning more about the stars and the universe. I have three university degrees; I consider myself something of an egghead.

I believe in the pursuit of knowledge for the sake of knowledge but I also believe that we have earth problems and environmental problems are topmost among these, and I believe with limited resources we have to weigh what are the costs and what are the benefits of expenditures that divert us from the problems here at home.

And I have made a statement to the House yesterday that, while we are so underspending to preserve a livable environment and our public services education, health, housing, job training and employment, while we are spending so little to make them effective and meaningful, we can't afford the billions of dollars we are spending on space right now.

I concluded by saying the stars will have to wait.

Two years ago I was one of six Members of Congress voting against the military authorization bill on the grounds it was wasteful, immorally, of the resources of America.

Today, with a far more popular program, the space program that doesn't have any moral guilt of the war, I wasn't one of six who voted against it yesterday; I was one of 102 members who voted against it, and you will find that you can chart the rapid increase in dissent right in the House of Representatives and the Senate by those Members who were concerned about the ecological fallout of programs like the space program, the SST, like the road program, like the housing program, much of which destroys communities and creates scale that demeans the individual, scale that's so overwhelming and grotesque, it demeans the individual; there are more and more Congressmen voting against this.

If you will support them, you will give them heart.

I think the future largely rests with you and people like you. There is an increasing number of Members of Congress who are responsive to your point of view.

Nobody would have guessed there would be 102 Members of Congress voting against that space program.

Don't think the Members of Congress aren't listening to you. The ones that want to survive are.

There will be an 18-year-old vote. This current generation of college students is so far better informed and more concerned than the generation that I was a part of that its glorious.

So I think you have a terrific challenge, a marvelous opportunity and you bring great talents, great intellect and great spirits, a sense of deep concern to bear on the role that you have set for yourselves.

I want to thank you both very much for your really marvelous testimony.

We wish you well in the months and year ahead and to assure you, if there is any way in which I can help you in your work, I want you to call on me.

Mr. McGrath. Thank you very much for coming to Fordham.

Mr. Scheuer. I appreciate the invitation.

(Recess.)

Mr. Scheuer. The meeting of the select subcommittee on education will again come to order.

We are very happy to welcome this morning Dr. James Hester, the president of New York University, then Basil Paterson, a very distinguished member of the New York State Senate and finally a very wonderful group of young people with whom I had the pleasure of meeting a thousand strong in the Bronx yesterday.

So we have an hour or two of very stimulating testimony ahead of us.

I suppose the university and the green halls of academe used to be considered a quiet oasis, sort of quiet waters upstream away from the clash of public events and the tensions of our time.

But today I guess of all groups in our society the university, and particularly the university presidents, are in the thick of the struggle of the discourse, the conflicts, the strident calls for change.

And so I call upon you as an expert in the role of a university leader, the university campus as a change agent in our society, to tell us what you think we can do, what you think we as Congressmen can do to preserve and enhance the ecology that we seem to be sorely abusing, and to point the way for a more beautiful, a healthier and a safer and a more attractive America.

I am very honored to have you, President Hester, and we look forward to having your views.

STATEMENT OF DR. JAMES HESTER, PRESIDENT OF NEW YORK UNIVERSITY

(Dr. Hester's prepared statement follows:)

Statement of James M. Hester, President, New York University

My name is James M. Hester, and I am President of New York University. I am pleased to be here today to give my support to the bill (H.R. 14753) introduced by you, Congressman Brademas, and your [illegible] of your colleagues to "authorize the United States Commissioner of Education to establish educational programs to encourage understanding of policies and support of activities designed to enhance environmental quality and maintain ecological balance." In supporting the bill I would like both to speak as a concerned citizen and then as President of a University with a longstanding commitment to environmental studies and research.

We have had Earth Day, with its appropriate slogans, demonstrations and clean-up projects. And now the work begins.

The marking of Earth Day culminated constructive efforts to bring the problem of a threatened environment to public attention and contributed to the creation of a popular desire to do something. This desire must now be translated into continuity of interest and a program of sustained and effective action.

Two threshold threats to the maintenance of continuity and development of a program concern me. First, as several scholars and commentators—Professor Edward Banfield of Harvard University and Alan J. Otten of *The Wall Street Journal*, to mention but two—have recently noted, we seem to be increasingly afflicted by a short-term enthusiasm for public and social issues. We seem to be following fashions in public issues—fashions more transitory than style changes in women's clothes. And, all too frequently, the current fashion in public issues has less effect on the underlying problem than changes in style have on female appearance. When we speak of environment and ecology, we can't afford fashion and fad; we are talking about life and death.

Second, we must be wary, I think, of succumbing to what Benjamin DeMott, the perceptive social critic, calls "the dream of Instant Transformation"—the dream that avoids confrontation with the hard fact that the reform of most institutions and long-time practices requires what Professor DeMott describes as ". . . excruciating effort, wearing struggle against dullness, habit, the bondage of ready-to-wear ideas." Awakening from "the dream of Instant Transformation" often leads to despair and defeatism, rather than to the renewed energy required to find answers to such questions as:

How do we cut into the system to reform it without destroying it?

What are the costs and consequences of a changed policy?

Who will bear the costs and consequences?

What shifts in responsibilities will be required under a changed policy?

Who will assume such responsibilities?

What effect will a new policy have on other national goals and priorities?

HR 14753, which would assist in the development and evaluation of curricula, the dissemination of curricula material, the training of teachers and the preparation of public information materials in the fields of environmental studies and ecology, sets out a modest program which could be of major assistance in maintaining a continuity of interest, developing action and, ultimately, in finding the answers to specific questions.

If HR 14753 becomes law and were adequately funded, it could be of significant assistance to New York University in expanding and extending the utility of its efforts in environmental studies and ecology. Our most recent survey shows that we are offering approximately 50 undergraduate, graduate and professional courses directly concerned with the environment and ecology. The first volume of the *Urban Research Inventory: New York City* and its supplement published by the Office of University Relations in Mayor Lindsay's office lists twelve major environmental research projects presently underway at New York University. The Institute of Environmental Medicine at the University's School of Medicine and the Environmental Science and Engineering group at the School of Engineering and Science are pioneering enterprises. This commitment and our experience give us an unusual opportunity to expand our efforts, to educate more students, to conduct more research and to make a greater contribution in providing information and curricula to other institutions prepared to increase their work in environmental studies. HR 14753 could significantly help New York University increase the influence of its work in environmental sciences.

In sum, passage of HR 14753 would be of great help to colleges and universities committed to environmental studies. I hope that the Congress will give the bill sympathetic consideration.

Mr. SCHEUER. Thank you very much for your testimony here. It is most interesting testimony, President Hester.

I am very, very glad that you have pinpointed the matter that politicians like Senator Paterson and I have been concerned with; namely, that when you get through with a binge of rhetoric and emotion that we all enjoyed so much, this whole bath of euphoria and catharsis that we submerged ourselves in 48 hours ago, where is the followup, where is the specific action program that is going to lead to better legislation, more enforcement, better decisionmaking both in the public sector and the private sector, and I think you have helped show us the way.

Dr. **Hester.** May I just say——

Mr. **Scheuer.** Please do.

Dr. **Hester.** As you know this is a time when the universities are more restricted in their support than ever before, as a result of a variety of circumstances, including the war in Vietnam.

We have all made beginnings in environmental studies and there is a strong effort on the part of students and faculty to expand these studies. We will be limited in this effort unless we gain support. That's why it is important to the support this bill, because of the cutbacks we are experiencing at the present time.

Mr. **Scheuer.** I agree with you. I think some of the cutbacks in health research, medical research, and some other areas of research are absolutely tragic and constitute public decisionmaking at its most bankrupt, most decadent.

You discuss on page 2 of your testimony, what are the costs and consequences of a change in policy. What effect will a new policy have on other goals and priorities?

In effect, you are suggesting that we measure in specific qualitative and quantitative terms alternative courses of action.

I have thought for a long time that decisions involved in building roads, dams, housing projects, SST's, are so complicated and so sophisticated that figuring out the ultimate environmental fallout is almost beyond the ability of the average human mind, and I have thought for a long time that we ought to set up a sophisticated model of a region or of the country, and if we are going to impact that model, be it rural or urban environment, if we are going to impact that model with a major public housing project or roadbuilding project, that all of that would be fed right into a computer and a tape-out which would, in effect, tell you all of the results in a given decision and what the cost would be; both the immediate cost and the long-term environmental and ecological cost.

This would have to be a multidisciplinary effort involving economics, science, and sociology, because many of the costs are not economic costs at all. They are community costs, social costs, health costs. They are total sum of satisfaction costs.

Do you think that a university, perhaps in conjunction with the private sector group, such as one of our sophisticated space agency type of business organizations, would be the right place to carry out a research and demonstration project involving the production of an ecological and environmental model of a great region like from New York City, the standard metropolitan statistical area here, or perhaps a model that would be the eastern part of the United States, east of the Appalachians, or conceivably, a model of the whole of the United States?

This is the dream of mine, that we can harness the multidisciplinary talents of a large university and produce a model.

Ultimately we are going to have to do it for this spaceship earth, because so much of our pollution, so much of our decisionmaking and the pollution it causes crosses not only State and city, regional boundaries, but national boundaries.

If you look at the pollution produced in the Ruhr Valley, it impacts dozens of nations in Europe.

Isn't it time we put the use of the technological model together to give us some cost information on which we could base these decisions?

Dr. Hester. Let me say I think your concept is right on, as some of the young people say today. Let me preface my remarks by saying in our School of Engineering and Science in the Bronx we are undertaking a massive study of the environment of the metropolitan area; it is computerized and we can measure the pollution in the metropolitan area and where it comes from and what it does and so forth.

This is not as comprehensive as the model you are studying. This is limited to measuring the pollution in the air, tracing the sources. You are talking about a much more complex kind of model that would involve a variety of considerations.

I think this is absolutely what we are going to have to commit ourselves to, because we have seen what happens when you don't look forward and try to anticipate the consequences of these fateful decisions.

Surely universities are the only resources that can bring together the variety of disciplines that would be involved in this kind of complex modelmaking.

Whether it would be a single university that would manage this or whether a number of universities should cooperate in a big project to create a model of the metropolitan area or for the east coast it is hard to predict.

But I think you would find that the interest of the universities in contributing their expertise to such a multidiscipline project would be extremely strong at the present time.

Mr. Scheuer. Well, I would like to suggest that you and Mr. Bragdon, I and others should be perhaps thinking about making an application to HEW or National Science Foundation or perhaps an application for joint funding from perhaps one of the great foundations and a Government source of funding to do just exactly this kind of thing and maybe we could get a consortium of universities and private sectors, perhaps one of the computer firms, one of the programs, IBM or some other great computer technology research, might join in a consortium of universities in multidisciplinary effort to build a model.

Dr. Hester. We will go back to the university with this idea and discuss it with our colleagues and then come back to you with some proposals.

Mr. Scheuer. I would think that the Rockefeller Foundation, Ford Foundation, or Carnegie Foundation might very well be interested in participating in such a study.

Dr. Hester. It is clear we can't stand still any longer and allow such great influences on the lives of millions of people to occur without planning the consequences. We are going to have to learn how to measure results before we can look forward to the future with any confidence.

Mr. Scheuer. I agree and I will call you soon or you will call me.

Now you lay out very clearly the danger of not achieving the continuity of interest in a program of sustained and effective action and you cite as a problem the short-term enthusiasm for public and social issues and you say that we can't afford fashion and fad, we are talking about life and death.

As a university president, which is a term which today is a synonym for political activist, what do you recommend to prevent this sense of futility and frustration setting in on the university campus?

What do you think should be given to the kind of people who appeared here today, the kind of people who organized the Earth Day, the kind of people who met up in Riverdale and proclaimed their concern for environment.

What do you advocate that our business do, our great business institutions do, our universities do, our Congress do to give these young people a sense that our society can make it?

We had a very thoughtful pair of students from Fordham here this morning about an hour ago who said they didn't think there was any means other than revolution for our society to make it; they hoped it would be a peaceful revolution but they weren't even sure about that.

There is a sense of frustration, not only among old codgers like myself but among the students on college campuses.

They have seen the wanton despoliation of our environment, they have seen the total lack of concern, the total insensitivity of so many of our important decisionmakers, public and private, that they are fairly close to being turned-off.

How do we turn them on again with faith that our institutions can make it?

Dr. HESTER. What young people don't realize when they express that kind of impatience is that we have had a variety of revolutions in this country in this century.

We have had a revolution with regard to education, we have had a revolution with regard to worker's rights, we have had a revolution with regard to social security, we have had a revolution with regard to the responsibility that the Government takes in health.

These are all revolutions that have occurred in your lifetime and mine. People living 30 and 40 years ago would be amazed at what has happened in this country with regard to action on social problems that were ignored a half century ago.

The problems of pollution and the problems of the environment were really not recognized as an article said in the *New York Times Magazine* section last Sunday, just 15 years ago.

Major problems of pollution hadn't occurred, and it is the great increase in productivity that has increased this problem.

We are capable of dealing with these problems. What is needed is sound thinking, real knowledge, substantial legislation to provide the guidance by which society can change its practices. What is needed for these young people is the opportunity to study, to understand the economy, to understand the true facts about the various forms of pollution, and that's why this bill is appropriate, because it provides the universities and the other educational institutions the opportunity to give these young people chances to come to grips with the facts and learn what it is that we must cope with.

A lot of the necessary action is going to have to come from the sector you represent, the political sector, because you can't expect a single corporation to impose on itself a great financial cost to eliminate pollution if its competitors aren't going to do so.

So there has to be legislation that affects all equally.

That's why I asked some of these questions: Are we willing to sacrifice shareholders' interests, productivity, and other factors to achieve what we are concerned with?

I think we can but it is going to take concern on the part of all the legislators and all of the people so that the costs that are imposed are not going to unfairly affect a limited group.

Mr. SCHEUER. Speaking of shareholders, what is NYU doing through its endowment?

Dr. HESTER. Our finance committee has not undertaken to act as a social policy committee. Its policy up to this time has been that its function is to provide maximum funds for the university and it has not undertaken to examine each of the companies it invests in from a social as well as an income-producing point of view.

This has not been its function.

Mr. SCHEUER. Do you think this should be its function?

Dr. HESTER. I don't know. I think if the universities are going to survive, they are going to have to be supported financially as effectively as possible.

If we are going to start diverting income for social reasons, then our education is going to suffer and this is a very complex question as you know.

I am just reporting to you what the present policy of our finance committee is. It is charged under the law to receive gifts for the university and to invest them as productively as possible.

It is not charged under the law to exercise a social function in this area.

Mr. SCHEUER. Senator Paterson, are you listening?

Senator PATERSON. No, I am not.

Mr. SCHEUER. I asked President Hester whether the university is presently exercising a social function in its ownership in certain corporations.

As you know, a ferment is taking place at Harvard. It has been reported that the trustees have not to date seen themselves as having a decisionmaking activity in the corporations in which they are investing from the point of view of ecological or environment pollution.

Dr. HESTER. Their legal responsibility as I understand it—and I believe it is correct—is to invest the endowment of the university in such a way as to produce the economic support of the institution.

They do not believe they have a right to exercise a social judgment on the part of the university about investments.

Their social obligation is to support the university.

If you start making moral judgments and you restrict income for educational purposes, you are exercising a judgment of what is right and wrong in a society rather than what is the most productive use of the endowment to support education.

Mr. SCHEUER. We are making moral judgments every day of the week a thousand times a day.

Dr. HESTER. But these men consider themselves to be experts in finance and they use that expertise just as they would for you, to try to produce maximum investment income from private investment.

They do not decide to limit that function to support their particular social values.

It might be inconsistent with what the students or the faculty believe.

There is no consensus in the university that we will give up income in order to promote such and such a cause.

Mr. SCHEUER. I am not asking the university, Mr. President, to give up income.

Dr. HESTER. I am explaining to you what their philosophy is.

Mr. SCHEUER. I am not suggesting that their philosophy ought to be that they sacrifice incomes in order to make a social input.

Dr. HESTER. But as soon as you substitute any moral judgment for your economic judgment——

Mr. SCHEUER. But these can be economic judgments.

I think it is frequently true that, if corporations pay more attention to the community and societal results of their product, they will make more money.

Corporations are notoriously the worst judges of what is good for them anyway.

Corporations throughout our history have been blind not only to the societal impact of what they are doing, but have been blind to their own profitmaking potential.

Corporations as a group fought minimum wages. Banks as a group fought the Federal Deposit Insurance Corporation a decade or two ago. Now they are happy to pay money to advertise on radio and television.

They fought wages and hours.

The medical profession fought subsidy of public health. Now it takes them generally a decade or two to find out that what they fought was in the general interest of society and was within their own financial best interests, too.

I find that a very narrow view of——

Senator PEARSON. Let me make one comment on that. I believe what we are asking of individual corporations or even in this case of an individual educational institution is unreal.

We are asking them to put themselves in the position of disregarding—and I will grant that you are right, in the long run it is in their own worst interests—but if we don't make it a competitively realistic approach they can't do it.

And what I am suggesting is for us to say to New York University, to their trustees, that you should invest in the kind of enterprises that are not going to further contribute to the demise of our environment, then we have to say nobody can, not just them, but nobody else.

And I believe that it is up to us as government to do that. If we say that it is a right of every citizen to be free from the environmental hazards that are being created, then we say to everybody, "You have no right to be contributing to the deterioration of our atmosphere," and that's the only way that the trustees of NYU or the trustees or the board of directors of any corporation are going to be able to compete.

Dr. HESTER. I support that.

Senator PEARSON. They are saying we must be competitive, but we want you to exercise a moral judgment.

I say no, the moral judgment must be advertised but I think it must be restricted to the area of their judgment.

Mr. SCHEUER. You want to restrict the area of judgment?

Senator PATERSON. Yes, because I want to say, if they are going to be polluting our atmosphere, rivers, lakes and oceans, the very streets we walk in, that's illegal, that's wrong.

Society has that right.

Dr. HESTER. Let me just point up that with a little aside.

I believe the corporations can adopt restraint and many of them are, but if you want effectively to control the polluting capacity of industry you have to impose it on a uniform basis so it affects them all alike—not so you don't unfairly penalize one company and not affect his competitor with restraint.

I am simply reportnig to you, simply from the standpoint of investment policy, what they consider to be the facts.

This question is raised by students who would like to control the portfolio. The legal responsibility is in the hands of the trustees. The students would like to impose their social values on the portfolio.

The primary social value we serve is education and we wouldn't invest in an enterprise that was exploiting human beings in some illegal way. We obviously wouldn't invest in an enterprise that was deliberately engaging in segregation. But the standard they follow is that they can invest in any legal companies, legally engaged in business enterprise in the United States, with the maximum return, to support the highest possible salaries for faculty members, the best education for students.

Mr. SCHEUER. I think that's extremely simplistic and a sanctimonious and dishonest statement of the alternatives facing them.

If you are a large investor in General Motors, it is not valid to say that, because you choose to vote your proxy to place on the General Motors board of directors a representative of the environmental interest, which is a public interest, it is not a good thing for General Motors.

Dr. HESTER. This would be your opinion but it might be different from that of the members of our board of trustees if they support the management.

Mr. SCHEUER. That's why I say that might be very poor economics.

It might be better economics in terms of potential the company could achieve for it to research products for packaging, for biodisposable.

Again this would have an extraordinary market for the guy that gets there fastest with the mostest.

Dr. HESTER. This is just a difference of opinion. I am reporting to you the opinion of those who have the responsibility to try to get the university as much income as possible and not to impose their views on social justice.

Mr. SCHEUER. I am not saying to impose social judgment. These are basically business judgments.

Dr. HESTER. They pick the best companies for business reasons; these are top men in Wall Street, and they pick the companies they think have the best prospects of producing a good return on a business basis.

That's why they are invited to be members of the finance committee.

Mr. **Scheuer.** Well, we are getting a little off the subject but I consider their mole's-eye view of their role to be a myopic one, an unresponsive one and a definite failure of leadership. Maybe at some point you and I could talk about the possibility of sitting down and chatting with them about a broader point of view on their role as investors of your fiduciary funds.

Dr. **Hester.** I would be delighted to.

Mr. **Scheuer.** And we are all impressed with the marvelous work of NYU, the great role it plays in the education of hundreds of thousands of New Yorkers, and none of us would want to do anything to diminish your funds to do your great work.

I look forward to meeting with you and Paul Bragdon in the near future and discussing the project you mentioned.

Thank you very much for coming today. We were glad to have your testimony.

Senator Paterson.

Senator, I am happy to welcome you here today. You are certainly one of the most thoughtful, articulate members of the New York State Senate. You honor our city and it is a great pleasure to have you here and we are privileged to hear your views.

STATEMENT OF SENATOR BASIL A. PATERSON, DEMOCRATIC DESIGNEE FOR LIEUTENANT GOVERNOR OF NEW YORK

Senator **Paterson.** Thank you very much, Congressman.

I am a legislator representing a district in New York City with an extremely heterogeneous population. I want to testify today about the special meaning, the special urgency that I and my constituents feel with respect to problems of environment.

To us, environment means one 15-year-old boy who died on 100th Street a few days ago, killed by carbon monoxide poisoning from a defective heating system. It means another dead boy, of about the same age, who died from an overdose of heroin. It means the countless others permanently brain damaged or dead from lead poisoning after eating wall plaster.

It means the foul air, the trash, the noise, the inadequate housing, the contaminated food, and the excessive rate of crime that enclose the life of far too many residents of the district. It means six-floor walkups, bathrooms in the hall, bathtubs in the kitchen, century-old schools and playing in rusting and dangerous abandoned automobiles.

But environment for us is not just a problem of the poor, although their priorities are unquestionably the highest. It means overcrowding and foul air in mass transportation facilities. It means pollution in the air and in the rivers, garbage and litter in the streets, inadequate power supplies, inadequate phone service, inadequate health service—deficiencies in every aspect of the quality of life. I will not burden you with a total list. I'm sure you will hear such lists from others who testify, and that you probably have one of your own.

The point I want to impress upon you is that environmental problems are nothing new, and we will not see the end of them in a few years or even a decade, no matter how hopeful we may be.

If real progress is to be made, however, we must build on as broad a base as possible the realization that we all are, in a very real sense, uneducated about the complexity of environmental problems. That is why I welcome the proposal before this committee, and pledge myself to support it in every way I can. This kind of educational program must contribute to the creation of the kind of political climate we will need if the destruction of our environment is to be effectively challenged.

I would like to comment, however, on some ways in which I think the legislation could be made even more effective. I would like to see some very specific reference made to a warning that the definition of environmental problems must not be allowed to deteriorate to the point at which it includes only leaded gasoline and polluted rivers. The real problem is much broader and more interacting—involving many of our most basic social and economic contradictions—and it is this focus that I would like to see mandated in the legislation. We must understand that not only corporate or individual avarice, but also basic economic insecurity continue to contribute to the formation of environmental problems. Poor education, unresponsive government, discriminatory employment practices, and other such very basic problems all play a part.

Also, I think that very strict attention must be paid to developing the understanding that environmental problems are not basically technological problems, but they are human problems. Of course, technology plays a major role in some of the more obvious and dramatic forms of pollution, but it is a technology devised by people. Solutions to the problems that result will not be effective if they are sought through the imposition of additional technology alone. Lasting solutions will have to be based on human programs, perhaps involving, if not sacrifices, at least tradeoffs.

Because I feel strongly about the need for such an approach to environmental problems, I would like to take issue with one aspect of the bill. That is the provision that would have the Secretary of Health, Education, and Welfare appoint a 25-man advisory council to supervise the implementation of the law.

This is not an administrative mechanism with which we are unfamiliar, and I think that many of us can foresee about how such a council would be made up, and how it would function.

It is extremely important that the broadest possible range of information and opinion be allowed to influence the content and the operation of the program that this bill calls for.

If I have learned anything as a legislator, it is the simple fact that no program can work without the involvement of the relevant community—be it teachers, students, parents, or administrators. Young people have the greatest stake in the outcome of the struggle with a contaminated environment, and their voice on the matter must not only be heard, it must be encouraged.

I would like to see the language of the proposed legislation changed to instruct the Secretary of Health, Education, and Welfare to see to it that all concerned segments of the population are adequately represented in the Advisory Council, even if that requires enlarging that body.

With respect to this proposal, I want to raise at this session a fear that is being expressed by some committed, well-motivated people. This is the fear that the environmental issue will be used as a "cop-out," a means of diverting national attention from such pressing issues as racism, war, and poverty.

I understand this concern, and to some extent I even share it. I am persuaded, however, that issues like pollution and other forms of environmental deterioration are not separable from issues like racism, poverty, and war, so long as a proper perception of the concept of environment is maintained, and we can forestall that argument very easily. It is my hope that through an expanded Advisory Council there is a better chance of establishing and maintaining such a broad perception of the questions that have to be addressed.

Although it is not the specific subject of the legislation being considered here today, I would like to take this opportunity to express my support for a much broader approach to the environmental problem which is being proposed in some quarters. This is the suggestion that the Constitution be amended to include an "environmental bill of rights," a guarantee that every citizen has an inalienable right to an unimpaired physical environment. Not only would such a provision in the Constitution enable citizens to have access to the Federal courts when this right is impaired, it would provide also the overall atmosphere—the environment, if you will—in which the program outlined in the bill could truly be maximally effective.

Underscored and supported by the constitutional change being suggested, the educational program you are proposing would be a much-needed and very welcome addition to the arsenal of environmental protections that we need so urgently.

Mr. Scheuer. Senator, thank you very much. I take your criticism of our bill and your suggestion for expanding the Advisory Council very seriously.

I think you have made an excellent point and I will be developing some specific language and checking informally with you on it.

Senator Packwood. May I add one thing, Congressman, as to the colloquy between you and President Hester.

I certainly share your concern and certainly would join with you in the feeling that business needs to be very conscientious.

My point is not leaving it to their good will—is that we found that too often in our history that leaving it to the good will of business incorporators and business boards and trustees and boards of directors is shortsighted on society's part.

What I am suggesting is, what you are saying to him as the president of a major institution in this country is something that should be said and something that we hope more and more be said to people who are in a position to influence boards of trustees and people who are wielding great financial influence.

I would agree with that. Certainly I think General Motors would be well advised to put an adviser on environmental factors on, but I think for us to really move in this area we are going to have to create the kind of climate that the kind of group that began Earth Day. They created it on a permanent basis or at least on a long-lasting basis, so that we will create the kind of conditions that will require that we cease deteriorating our environment.

Mr. SCHEUER. Senator, I couldn't agree with you more and I don't think there is any Member of the House of Representatives who has worked harder at producing specific legislative controls on environmental pollution than I have. I have a package of about half a dozen separate pieces of legislation that, taken together, would attack the problem of bottles, cans, abandoned automobiles, air pollution, and the like.

But as you know, there are lots of things that you can control and prohibit in legislation, but perhaps there is a higher standard of responsibility that you cannot legislate which, it seems to me, the universities could represent.

It seems to me they could be a community conscience on boards of corporations; they could urge courses of action that would be a hundred percent sound and wouldn't be inconsistent with the profit motive at all, and in fact might enhance the profitability.

I suggest to you that perhaps the greatest corporation of them all, the Metropolitan Life Insurance Co., is a perfect example of this.

I think you probably remember not much more than a decade ago, Frederick Ecker, then president of the Met, in justifying their policy of discrimination, said that blacks and whites don't mix and maybe a hundred years from now they would.

That's a direct quote from Frederick Ecker at the time that I was chairman of the advisory council for the State commission on human rights in 1955.

The Met ultimately changed that policy, after we passed legislation in Albany—the Met-Coffey legislation and finally the Sharkey-Brown-Isaacs bill—that forced them to change it.

Can you tell me that if the Met had voluntarily changed that policy before we passed that legislation they would have suffered economically?

Have they suffered economically since we forced them to change it?

This is the kind of decision we are talking about, it might have been a little bit in advance of the legislative mandate and wouldn't have cost them a sou.

In fact, it might have broadened the market for their product or service.

This is the kind of conscientious decisionmaking I am talking about. It doesn't conflict with maximizing profits, which is quite obviously the role that NYU or any other university must carry on in investing their endowment funds.

Senator PATERSON. I couldn't agree with you more, Congressman. I think you have proven the point with your example, that they didn't do it until they were mandated.

It wasn't just the mandate of the law. It was when they started having difficulty employing clerks who could do the job.

You see what's happening in the New York Telephone Co. You have heard the criticism. You pick up the phone and it's a black girl, the operator.

Somebody says it's because she can't do it.

Nobody talks about the educational system that hinders her from competing in business.

Unfortunately the form of our society is such that it hinders people from doing their best in their best interests until they are forced to, either by mandates of law or mandates of the economy.

Mr. SCHEUER. If they had your kind of a voice on the board of directors, maybe they would see the economics more clearly.

Senator PATERSON. I think the students are going to make sure they see that.

I think even President Hester is aware of the pressure he is going to receive, because there are people that are going to determine to make those changes even if we don't get legislation.

Maybe you can't mandate love, but you can certainly mandate against hate, and you can certainly mandate against the crime we are committing against ourselves in environmental pollution.

Mr. SCHEUER. I couldn't agree with you more.

Now why couldn't President Hester, assuming NYU owned a substantial amount of stock in the Metropolitan Life Insurance Co., have joined a public member of the board to the Met who could have expressed this kind of point of view on their rental policy?

Perhaps if we had had that 15 years ago, Ecker wouldn't have been making the kind of statement that flew in the face of our historic and political beliefs as well as the crass economic interests of the Met.

I suggest there is enough history to prove that business doesn't know what's good for it; that business traditionally has an instinctive Pavlovian reaction against constructive social legislation that ultimately helps them; that just from the point of view of economics, their own economic best interests, they could use a voice representing the public conscience on their board.

We have spent enough time on that. Let me ask you as a legislator who is obviously keenly involved, deeply concerned, two questions.

I am very conscious of the criticism that interest in the environment is a cop-out from the problems of race and degrading housing and disfunctional school systems, ineffective health systems and so forth; it is a cop-out from facing up to the problems of our urban society, a society involved in an immoral and wasteful war, a society that is bigoted.

No. 1, how do we make it clear to the poor and to the minorities that we are not copping out?

Basically the problem of the environment is largely a central city problem, the problem of the downtown hard cores, where there are specific and identifiable concentrations of poor blacks, Mexican-Americans, and Puerto Rican-Americans.

Second, how do you as a politician feel that we can continue to build the momentum that we built 2 days ago on Earth Day into specific action programs and how we can prevent that great day from being just a one-shot exercise in empty rhetoric?

Senator PATERSON. Let me take them in inverse order.

Mr. SCHEUER. Right.

Senator PATERSON. First of all, we know the problem of Earth Day being hopefully not just a one-day shot, and I was struck by the group in charge of Earth Day changing their title, reincorporating; instead of being an Earth Day group they are going to be an action group.

One of the problems is to challenge our major industries. No question that the major pollutant of the atmosphere is the automobile industry.

But we know the amount of money spent not just by the car manufacturers but also those who produce the steel and the oil and those who produce right down the line. I am suggesting maybe one of the ways to keep as much interest as possible would be the bill you have suggested, a continued educational program.

Another might be that somebody might take on General Motors head on—I use General Motors merely as symbolic of the whole industry—that we say there has to be a deadline when the internal combustion engine is either going to be considered no longer lawful to produce, or that they will have regulated it in such a fashion as to prevent the emission of the vaport they set off.

When I took a light plane upstate a week ago, a person pointed out something to me and said that was pollution, and I had never seen that the way you see it from the earth starting up.

I know the powers of General Motors, Ford, Chrysler. I know the power they have.

But somebody has to stand up and challenge them.

When you get to the other question, the question of how you get people to believe, in my community, for example, that it is not a cop-out, I think one of the answers is very simple, that we attack the problems that can be immediately attacked, the battle of the legislator to remove cars that are abandoned in the streets, the buildings that are abandoned as unsound structures, that are sitting there, used by junkies—there's no gas, no utilities—they set fires and they become a menace to people who reside in the adjoining buildings, and they become trash heaps because rats are running out of those buildings because janitors in the adjoining buildings are throwing their junk in those buildings.

They should see to getting those torn down, again not having to get a politician's influence to do something that should have been done.

I think we can prove it is not a cop-out by hitting the problems we are immediately concerned with.

Mr. SCHEUER. By hitting the problems we are immediately concerned with?

Senator PATERSON. Yes, I think it is a problem.

When you say it is a big city problem, it is, and yet I look at Lake Erie, a dead body of water now, and I wonder how many people realize the size of this lake.

It is the distance from New York City to Boston. New York to New Haven would be about 50 miles, so that's the breadth. A huge body of water.

They dare not walk in the water.

Senator PATERSON. That's right. Even Lake Superior is threatened, the largest body of water in the entire world, the second largest inland body of water.

We have a river in Cleveland, the Cuyahoga, that's almost officially classified as a fire hazard, a river is a fire hazard, because of the pollutants and junk thrown into it.

We have another one in Buffalo at the same stage.

I think we get people to believe we mean something when we attack the problems not only on a grand scale but in our own areas.

Con Edison is still polluting. You drive up early some morning you will see what they are spewing into the atmosphere.

Who is enforcing the law? I think if we enforce the law and take some political chances that you won't get the political contributions you are expecting—of course I don't have to say this to you, Congressman, because I know how you feel about that—but unfortunately many of the people elected and in public life are always balancing the scale, "If I say that, I am not going to get the campaign contributions."

We have to start taking the chances that maybe we can educate business that it is in their best interest, not only in the long run but also immediately.

Mr. SCHEUER. Thank you very much, Senator, for your provocative and thoughtful testimony.

Senator PATERSON. Thank you very much, Congressman.

Mr. SCHEUER. And now, Mr. Madigan and your associates, would you step up?

Incidentally, if you gentlemen want to wait until Mr. Madigan and his associates are finished, I would be glad for you to come up en banc and give us your views on the problems of the environment.

Mr. MADIGAN. These are Peter Pelikan and Michael Silfen, who have participated with us in programs at Wave Hill during the year.

Mr. SCHEUER. Let me congratulate you for that tremendous program you had yesterday. I understand there were representatives from private schools, public schools, and parochial schools from all over the Bronx.

There were perhaps more than a thousand young people who were reacting—expressing themselves in a way that was moving and beautiful, and it was just a tremendous occasion.

I want to thank you and your two colleagues for your great leadership in pulling it off.

Mr. MADIGAN. Well, we are indebted to you for your effort to be with us that day also.

Mr. SCHEUER. I was honored being there.

STATEMENT OF RICHARD A. MADIGAN, EXECUTIVE DIRECTOR OF THE WAVE HILL CENTER FOR ENVIRONMENTAL STUDIES

Mr. MADIGAN. Wave Hill Center for Environmental Studies is a cultural institution of the city of New York devoted to public understanding of man's environment. Since Wave Hill was given to the city in 1960 by the Perkins and Freeman families the programs have explored the relationship of man and his environment.

In recent years, Wave Hill has developed specific programs dealing with the urban environment of New York City. With funds provided by the Ford Foundation and the Old Dominion Foundation, Wave Hill has greatly increased its efforts in recent months to develop relevant education concepts using the resources of the environment. All aspects of the environment—biological, physical and cultural—are components in the Wave Hill programs. The impact of the programs is being felt as increasing numbers of students and faculty are influenced by new methods of instruction.

This initial phase in any educational program is creating a sense of awareness. By early 1970 it is virtually impossible not to hear or read about the environment. The public has, at long last, begun to be aware of the environment and the degradation caused by man. This awareness must now be channeled into concern and action.

To realize that thousands of streams are polluted, that air is frequently foul and that noise decibels are intolerable in many areas is only part of the picture. Man must be concerned about what has happened; he must be motivated enough to bring about change.

On April 23, 1970, Wave Hill sponsored Earth Day in the Bronx, and over 800 students representing every public, private, and parochial school in attendance.

Following an address by Congressman James Scheuer, the students participated in three of 21 seminars on various aspects of the environment. It may have been the only environmental teach-in in the New York City area to provide students with relevant information concerning the environment, and suggest viable followup programs.

This day long event, sponsored by Fabergé Inc., was one more example of Wave Hill's programs to develop educational models which may be used elsewhere.

Wave Hill works closely with Bronx districts of the board of education and with secondary schools. In conjunction with Herbert Lehman College a preservice and inservice teacher training program was developed; the program is being revised and will operate in the future in cooperation with Fordham University.

Only by training teachers can environmental education programs develop significant multiplier effects. We seek to train teachers in environmental education in order that they may train students.

The proposed environmental quality education bill (H.R. 14753) contains provisions which will greatly expand educational efforts in this area and encourage new ones. Those of us in environmental agencies realize that legislation alone will not do the job. To make mandatory stiff penalties for environmental destruction is essential; to provide funds for technological advances to improve the quality of air, water, and land is vital. Needed as this legislation may be it is only through education that the public will come to understand the necessity of improvement. Every individual must be made to realize that it is his responsibility for improving the environment.

Environmental legislation is needed—long overdue—but needed. The Environmental Quality Education bill is a great step in the right direction.

Wave Hill seeks to use the educational methods called for in H.R. 14753 to bring about a "wave" of concern—a wave that will result in positive change—improving the quality of our environment and the quality of our life.

I am completely convinced that environmental education is going to be measured in terms of its ability to change the behavior of society.

The two students with me have participated in a program concerning a pollutant, a single pollutant, ozone, at Wave Hill, and students with many other schools to try to provide the kind of educational experiences not now obtainable in most of our public and private schools.

Mr. SCHEUER. I want to ask you a question on your last sentence in which you say we have to change the behavior of society.

What are the implications of that and how can it be done? Is the change agent going to be public decisionmaking or private decisionmaking, legislation, attitude changes or what?

Before that, may I hear from your two colleagues?

Mr. MADIGAN. Please do.

Mr. SCHEUER. Please identify yourselves for the record.

Mr. PELIKAN. My name is Peter Pelikan.

Mr. SCHEUER. Identify your school.

Mr. PELIKAN. Bronx High School of Science.

Mr. SCHEUER. Yes. You are both from Bronx High School of Science; right?

Mr. PELIKAN. At my school which is predominantly a science school, science oriented, each student has to study chemistry, biology and physics.

However, the course is set up as an introductory course to the subject and specific problems and ecology and environment are in a sense beyond the scope of the chemistry course which only spends a month studying organic chemistry.

The biology course maybe spends 2 weeks studying ecology.

Now in my school there are available in the senior year two electives. However, there is no program available to study as yet, to study the environment, and I think the program that my friend and I have studied at Wave Hill is applicable to a school situation and it was of great benefit to me and I think it would be to my fellow students.

Mr. SCHEUER. So you are telling me that as a Congressman I had better build a few fires in the Bronx in order to make some curriculum changes in the Bronx High School of Science? Is that the message?

Mr. PELIKAN. Yes.

Mr. SCHEUER. I think it is a very good message.

Mr. SILFEN. My name is Michael Silfen. It shouldn't only be in the Bronx High School of Science but in every school.

They have a few problems with our ozone chamber in the fact that there are only six students working with it and at times even six was too much.

The chamber is small. It is just physical things that have to be worked out.

You know, you have a class of 35 students in a public school and how are you going to get 35 students all to be in close contact with plants, observing what's going on?

And that just works out to one big mess in the long run. So, you know, there are problems you have to work out in that. Maybe you have lab periods. These are educational problems but what I want to talk about is that, I was down on 14th Street yesterday or 2 days ago.

Mr. SCHEUER. Were you one of the fellows that left all those paper plates and cups there?

Mr. SILFEN. No.

Mr. SCHEUER. I am glad to hear it. A lot of those demonstrators were environmental polluters in their own right.

Mr. SILFEN. Well, some group of people walked on Fifth Avenue and dumped garbage right in the middle of it.

I got the impression that everybody seems to be aware of the problem but nobody knows what to do about it.

You sit and you talk with the president of a university or another Senator and everybody has their own ideas.

The problem is so new and so recent that there is no precedent for us to follow. There's no examples that we can use in our reasoning to get at it, you know.

Do you restrict business? You restrict business, you lower your standard of living.

People don't want to lower the standard of living.

Mr. SCHEUER. How do you define the standard of living? Is it just consumption? Is it just the number of automobiles you own or the number of kilowatt-hours of electricity that you consume in electric hair dryers and electric toothbrushes and electric meat carvers?

Or isn't it the general satisfaction you enjoy which may be enhanced by a reduction of the goods you consume or maybe a change in the type of goods you consume?

Mr. SILFEN. Well, you see, when you get into a field like that, the standard of living, your personal satisfaction, I might need an air conditioner in the summer, I might need one in my car, I might need three cars.

Well, you create a demand and companies respond to that demand and you have your own business cycle functioning out of that.

But I just get the impression that what's required of us is the change in the national conscience, not the setting up of an environmental utopia run by computers who compute the statistics and help lead us in our decisions, but just an entire change in the way we think.

Maybe we have to be a little less greedy, each of us, maybe we can't buy all the fancy clothes we need, and just become a little more aware of what's actually going on with ourselves.

You know, how many of us walk down the street and yet we litter unconsciously?

I am sure everyone of us bought an ice cream at one time or another and just let the papers go.

This is pollution. This breeds rats.

Each individual must be made aware of this.

Then you come to your political groups, right?

Well, when the car show opened there was a demonstration in Central Park and the Black Panthers were there, let's say.

They don't care about pollution. They are out for their own gains.

Another group might be out for their own gains. They don't care what the Black Panthers want. They want their support, their weight in sheer numbers.

But the Black Panthers don't care what the environmental people want, so long as they don't interfere with them.

Mr. SCHEUER. Mr. Madigan, let me ask you for some specifics on your last sentences.

You said we had to change the behavior of society. Who is going to change it? What are going to be the criteria? How is it going to be effected and what are the specific actions that we can take following that great outpouring of concern 2 days ago that are going to produce identifiable changes in these attitudes?

Mr. MADIGAN. I am using the phrase that we've got to change the behavior of society in that I think it is far too prevalent today to say "they" are polluting.

To change the behavior of society will require specific educational programs starting in the elementary grades on up.

You have to convince the student, whether he is living in Hunts Point or the upper East Side, that it is in his best interests not to throw that can on the street, that it is in his best interests to use biodegradable material, that it is in his best interest to use intelligently the environment.

I think, unfortunately, the environment of the classroom is about as far removed from the environment of the home as any two things can be.

Our programs seek to bring these two things together. You do certain things in the environment of the home or of the school and you would do certain of them in a Van Cortlandt Park or Wave Hill.

We feel that by convincing all individuals, especially the young students, that they are existing as entities within a total environment, that we can bring about the kind of behavioral changes that must be done.

When I look at the students some of our teachers are working with that are in the sixth grade now, you realize that in another decade these are the teachers, I take pause. We've got roughly a decade to bring about the kind of educational impact.

And I am convinced that if we do not bring about the educational change we will not survive.

I don't think we can legislate the kind of change alone without education.

Mr. **Scheuer.** Education of both the decisionmakers and the consumers of goods and services.

Mr. **Madigan.** And the individual consumer of all goods and services, right.

Mr. **Silfen.** The question is, how do you do it? So you educate all these people, make them aware of problems of pollution.

But you still have a fire hazard of a river in Cleveland, and you still have the areas that you have destroyed, the wildlife and beaches destroyed in Santa Barbara, you still have that destroyed.

So what this bill is going to help to do, I hope, is that it will finance scientific organizations.

You know, people might frown at that, "ha, science," but they are going to give you your solutions because nobody knows what's going on in plant deterioration from ozone, which is what we were studying.

Nobody actually knows what goes on. We would examine young plants, old plants, determine their susceptibility, look at exposed plants to light before they were fumigated, then keep them in darkness, then fumigate them.

Nobody actually knows what goes on in plants, the actual reactions that destroy tissue.

So what has to be done is to finance scientific research into this field to find cures, because Lake Michigan, you know, it will take 500 or 800 years before Lake Michigan is replaced by fresh water.

Mr. **Scheuer.** We don't need a lot of research on Lake Michigan. We know what's wrong there.

Mr. **Silfen.** Not what's wrong, but how to drain it and get it out.

Mr. **Scheuer.** I will ask you a problem as a scientist. To make Lake Michigan clean, if you had the control, could you make the decision tomorrow that would bring Lake Michigan back in a quarter of a century?

Would it be lack of knowledge?

Mr. **Pelikan.** I think so. At least the way my education has progressed in the present system, if you want to know anything about pollution, you have to do it on your own. You have to spend a Monday afternoon from 4 to 8 o'clock at Wave Hill rather than taking that as an offered course or required course in place of something else.

Air pollution is an interdiscipline. Air pollution needs a study of economics as well as biochemistry and it needs a study of all sorts of political angles, none of which have been integrated for me.

I have learned history, biology, chemistry. But if I want to know anything about air pollution or water pollution, I have to do it on my own.

And I think this bill would provide more of a merging together of different disciplines for the study and in that way maybe in 10 years scientists will have been educated to the solution of our environmental problems from first grade rather than from graduate school where they maybe find material for it.

Mr. Madigan. That's it precisely.

Mr. Scheuer. Not first grade; preschool.

Mr. Madigan. That's why I am in favor of this bill, and for a lot of selfish reasons, too. We do have preservice, training, and pilot programs we are ready to start immediately, providing we can get the funding to do it. The foundation money that's been supporting us is primarily pilot money.

We have the models set up. We can start them in the Bronx. They can be easily replicated elsewhere.

Mr. Scheuer. In the meantime, before this bill gets passed—and it may be several months before it is passed—maybe we can apply for some moneys under the Elementary and Secondary Education Act under title III.

Mr. Madigan. I can be in touch with your staff about that.

Mr. Scheuer. Yes. That would be great.

Gentlemen, I can't thank you enough for coming here. I am really in your debt, not only for your very stimulating testimony today, but for the great, great experience, the only thing I can call it, that you provided me yesterday. We are indebted to you for your concepts.

Mr. Madigan. Thank you, Congressmen.

Mr. Scheuer. We will now invite our four friends.

Will you come up here, identify yourselves by name? And we will take 10 minutes before lunch to hear your views on this bill.

All right. Let's start from left to right. Each of you identify yourself.

Mr. Mageor. David Mageor, Stuyvesant High School.

Mr. Giller. Evan Giller.

Mr. Nadel. Steve Nadel, Stuyvesant.

Mr. Geffner. Paul Geffner.

Mr. Bass. Steven Bass, Stuyvesant.

Mr. Arno. Peter Arno.

Mr. Schweitzer. Mark Schweitzer.

Mr. Scheuer. Very good. There are seven of you. Do you each want to speak for a minute and a half?

Mr. Schweitzer. We didn't come prepared to speak.

Mr. Scheuer. I know you didn't. You are obviously young people concerned, you have put in legwork, sweat, equity. I would like to hear you sound off.

STATEMENTS OF DAVID MAGEOR, EVAN GILLER, STEVE NADEL, PAUL GEFFNER, STEVEN BASS, PETER ARNO, AND MARK SCHWEITZER, STUDENTS AT STUYVESANT HIGH SCHOOL

Mr. SCHWEITZER. One of the first things I would like to answer, you asked the question a number of times; Who dropped the paper plates?

I heard sanitation cleaned up 8,000 tons after Earth Day.

Mr. SCHEUER. Citywide?

Mr. MAGEOR. 14th Street.

Mr. SCHEUER. I think at 14th Street they had quite a problem on that day, and Fifth Avenue.

It's very interesting that you saw a little bit of hope for the future.

Let me ask a question. One or two of you can answer.

What do you think we ought to do as a followup to Earth Day in our society to put meat on that skeleton and make it very real?

Mr. ARNO. You are talking about education all morning long on what is being done and we wrote a high school curriculum for relating environmental problems to physical sciences, biology, physics, social sciences, English, math, art. We distributed these.

Mr. SCHEUER. Off the record.

(Discussion off the record.)

Mr. SCHEUER. The students did this themselves?

Mr. ARNO. Steve Nadel and I did in conjunction.

Mr. SCHEUER. There being no objection, I will ask that this report be inserted in full in the record at this point.

(The report referred to follows:)

HIGH SCHOOL ECOLOGY RELATED CURRICULUM: TO BE USED IN ALL SUBJECT AREAS ON APRIL 20 IN CONJUNCTION WITH THE "EARTH DAY" TEACH-IN

The state of the environment concerns and affects all. On April 22nd and in the days and weeks following, a nationwide effort will be made to make the public aware of the gravity of our present environmental situation.

As teachers, you and your colleagues enjoy a unique position. You have the capability of reaching the vast number of students across the country who will inherit this polluted world unless something is done. Please examine this suggested curriculum carefully. If you have any questions or suggestions, please contact us.

The Time for Action Is Now!

STUDENTS FOR ENVIRONMENTAL ACTION.

CLASSROOM PROJECTS ON ENVIRONMENTAL CRISIS FOR HIGH SCHOOL TEACHERS

I. PHYSICAL SCIENCES

(A) *Biology*

(1) What is ecology? Explain the balance of ecosystems, food chains and life cycles.

(2) Population: Is overcrowding a major cause of crime, disease, and drug addiction? Study of different theories: Malthus, Sadler, Doubleday, Godwin, Marx—what are the natural mechanisms of population control?

(3) Pesticides: Pesticide content in foods—do pesticides always yield higher food production?

(4) What is eutrophication? How can it be reversed? Compare a eutrophic lake with an oligotrophic lake. Oligotrophic lake—many species, few individuals. Eutrophic lake—few species, many individuals.

(5) What are the benefits of bio-degradable goods?

(6) What is in our foods? (Food additives and preservatives)

(*B*) *Physics*

(1) Energy consumption: Is there such a thing as clean energy? What are the waste problems involved whenever man produces energy?

(2) What is the potential of nuclear power? Can it replace convention fuel sources as a pollution free energy form? What about thermal pollution? Radioactive wastes?

(3) What are the prospects of solar power? Tidal power?

(4) Noise pollution: Have danger levels been reached? What has to be sacrificed in order to curb noise, (SST, new airports, machinery, etc.)? What can be done?

(*C*) *Chemistry*

(1) Air Pollution—Smog: What are the pollutants in our air? What are the photochemical reactions that produce smog? What are the effects of pollutants on: health, weather, and the composition of the atmosphere?

(2) Internal Combustion Engine: Why and how does it pollute? What are the pollutants? What are their effects?

(3) Discussion: Can we afford to have 100 million internal combustion engines? Should we replace the internal combustion engine with the electric or steam car? What about improved mass transit?

II. SOCIAL SCIENCES

(1) Set up debates: Can there be infinite growth in a finite world? Does capitalism breed exploitation of natural resources? Is population control too late? Should we outlaw the internal combustion engine? Does overcrowding lead to crime, disease, or war? What is the future of the city?

(2) Explore legislative approaches to a cleaner environment: What is being done? What bills are currently before legislature? What has been the effectiveness of past laws?

III. ENGLISH

(1) Effective education on our environmental crisis: Media, schools.

(2) Read works by naturalists such as Thoreau and Frost.

(3) Set up debates: Need we dismantle our technological society in order to end pollution? How does our society train people to be polluters? Must man change his life style to save his environment?

(4) Write poems and essays on environmental problems.

IV. MATH

(1) Provide illustrations of geometric progression vs. arithmetic progression. Illustrate Malthusian principles.

(2) Explain population curve.

(3) Calculate surface area of earth. Compare area taken up by human beings to area taken up by autos, highways, garages, etc. Calculate for now. In 100 years.

V. ART

(1) Make collages showing contrast between a clean and polluted environment.

(2) Have a poster, button, or cartoon contest.

(3) Have a sculpture exhibit on pollution.

If you have not already planned projects for your classes we hope the above suggestions will be of service to you.

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Mr. NADEL. Basically this is an outline curriculum for discussion.

Mr. ARNO. Right. We are writing to the teachers, asking them to send to us and we are in the process of devising more comprehensive programs right now.

We don't feel we know more than the teachers, but there are hundreds and thousands of educators in the country, but I have never seen an ecology-related high school or college curriculum.

Mr. SCHEUER. If you talk to the witness who preceded you, I think you will find some.

Mr. ARNO. We saw that. It was far from adequate, we thought.

Mr. SCHEUER. I am sure what you have given us for the record will give us all food for thought.

Mr. GEFFNER. I think, answering your original question, we have to make a choice right now. If our basic growth is good, we have to make a choice whether we want to follow that.

Mr. SCHEUER. You don't believe in exploding GNP for the sake of exploding GNP?

Mr. GEFFNER. That's right. This is exactly why education is so important because, if we don't change that ingrained value system, that constant growth is good, nothing is going to be accomplished.

Mr. GILLER. I would like to point out, if we are to change the style of life in society in the United States, I think right now the burden for leadership is on all people in Government because on their own I think the majority of people in the United States do not realize the problem and are not willing to give up the luxuries they are used to, and it is only through legislation and education and I think that legislation will have to be the answer right now.

Perhaps that may not be the answer. If you people—I mean people in general—in Government are not willing to provide us with the correct legislation, then there has to be another alternative.

I don't know. As the people from Fordham said, maybe it is revolution.

Mr. GEFFNER. I think that's the point. You have to try to change the values but that may take too long. You can't sit around and wait for that to happen, as he said.

You are not going to be able to get people to give their luxuries up. It has to be the Government in this case.

Mr. SCHEUER. You don't think attitude changes are important?

Mr. GEFFNER. It might take too long. It's up to the Government.

Mr. GILLER. It's not that attitude changes are not important but they will not occur by themselves.

We can't sit around and wait for people to realize the problem and not drive automobiles.

Also one other point. If we hope to solve the problem, I think things have to be done by government that will really give people substantial alternatives, like mass transit for instance.

People will not give up their automobiles unless they have comfortable mass transit. Very logical. And unless we stop spending money on other things such as the SST.

Mr. SCHWEITZER. But I think the backbone of any legislation that's going to come is going to have to be a change in social revolution.

Ecology we call a science but actually it's a basic philosophy. People have to become ecology sensitive—if legislation is going to last and bring a permanent change in the country.

Mr. ARNO. Ecology says to us all power pollutes. There is no form of energy we can harness that provides clean air, that provides clean water.

You have nuclear energy. There's thermal pollution. There's the radioactive byproducts and, so far as we know, the technology right now has no answers to clean energy.

So you say that we will all turn to mass transit. Sure. But mass transit is going to require the energy also.

What has to be done, you have to slow down the fact that the automobile is a sex symbol in the United States, it is a symbol where people think that they have to own one out in these rural towns, and there are other methods of transportation such as walking.

Mr. SCHEUER. And it has to be 350 horsepower, has to be able to go from 0 to 60 miles in 8 seconds.

Mr. ARNO. That's right, and in the city actually the quickest and most economical method of transportatoin would be the bicycle.

Mr. GAFFNER. We think a tremendous advance on that, a bill introduced by Mayor Lindsey, I think, to ban automobiles in midtown.

If you had a bicycle, something to increase the transportation system among these lines would really be fantastic.

I think it was pointed out before this country is the only country that doesn't use bicycles extensively.

Mr. GILLER. It is an interesting fact that it is almost impossible to get from Queens to Manhattan by bicycle, and it is illegal——

Mr. Scheuer. You mean even with the Triborough and the tunnel?

Mr. Giller. And the Queensboro.

Mr. Scheuer. Gentlemen, we are very much in your debt for your testimony which is extremely interesting and stimulating, and also for coming down.

Mr. Schweitzer. I would like to give you these petitions.

Mr. Scheuer. Right. Thank you very, very much, for coming.

(Luncheon recess.)

AFTERNOON SESSION

Mr. Scheuer. We are very happy to have you here, Mr. John T. Conway, executive assistant to the chairman of the board of Consolidated Edison of New York.

STATEMENT OF JOHN T. CONWAY, EXECUTIVE ASSISTANT TO CHAIRMAN OF THE BOARD, CONSOLIDATED EDISON CO. OF NEW YORK, INC.

Mr. Conway. Thank you, Mr. Chairman.

For the record I am John Conway, executive assistant to the chairman of the board of Con-Edison, and former executive director of the Joint Committee on Atomic Energy, and if it please the committee I request that my statement and attachment be introduced into the record as if read.

Mr. Scheuer. There being no objection, so ordered.

It will be introduced in the record at this point.

Mr. Conway. Yes. Thank you.

(Mr. Conway's prepared statement follows:)

Statement of John T. Conway,[1] Executive Assistant to Chairman of the Board, Consolidated Edison Co. of New York, Inc.

My name is John T. Conway. I am the Executive Assistant to the Chairman of the Board of Consolidated Edison Company of New York, Inc., an electric utility company servicing New York City and Westchester County.

I very much appreciate your invitation to appear before your Committee today and to comment upon the Environmental Quality Education Act (H.R. 14753), co-authored by Congressmen James Scheuer and Ogden Reid of New York, and others.

On behalf of Con Edison, I wish to say that we are in favor of this bill and its objectives. We agree with the statement of Congressman Scheuer that "many of our environmental problems are the results of ignorance" and believe it is desirable that the United States Commissioner of Education be authorized to establish educational programs to encourage understanding of policies and support of activities designed to enhance environmental quality and maintain ecological bounds, which is the stated purpose of H.R. 14753.

Specifically, we believe it would be in the public welfare for the U.S. Commissioner of Education to be empowered to make grants:

1. To educational institutions and agencies to develop courses on environmental projects for primary and secondary schools, institutions of higher learning, and for adult education;

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2. To finance pilot projects to determine the effectiveness of environmental courses and curricula, either directly or through contracts with public or private educational agencies;

3. To make grants to institutions of higher learning to provide pre-service or in-service training to teachers and other professionals or voluntary workers;

4. To educational agencies at all levels of government for the improvement of environmental education;

5. For the preparation and dissemination of environmental education materials, including use of the mass media.

In addition, assuming that the proper persons with necessary credentials are selected for membership, we would favor the appointment of an Advisory Committee on Environmental Quality Education to make recommendations and advise the Secretary of Health, Education, and Welfare in helping to meet the objectives of this legislation.

As the electric utility company privileged to serve this area, Con Edison feels a heavy responsibility to meet the needs of the 9 million persons residing within the 625 square mile area it services, at the lowest cost possible with a minimum impact on the environment. We are required by law to meet the demands for electricity placed upon us; demands which currently are growing at approximately 375,000 kilowatts per year.

Under present technology and technology foreseeable in the future, there is no way of producing large amounts of electricity required by modern society without some effect on the environment. It is important, however, that the adverse effects be kept to a minimum and Con Edison is dedicated to that objective. However, the problem of pollution is not only a problem of electric generation any more than it is solely a problem of any specific industry. In the final analysis, it is an individual problem since each of us on one way or another causes pollution of one sort or another. It is imperative if we are to be successful in cleaning up our environment that every individual in his daily life conscientiously conducts his activities in such a way as to cause a minimum impairment to the environment. If proper environmental education is made available to all Americans beginning at the primary school level and continuing on through secondary and higher learning, a major step forward will be made in securing the necessary cooperation of all citizens.

Con Edison has undertaken a program to inform the public of environmental actions it has taken in helping to improve the environment in the New York City area. For the information of the Committee I would like to submit for the record an attached summary which we are distributing, explaining what we as a company are doing in an effort to minimize any adverse effects from electric generation in our area.

We recognize, however, that a much broader educational program is necessary covering not only the electric utility industry, but all industry and all individuals. This type of educational program with the objectives set forth in H.R. 14753 can not be accomplished by industry alone, but must get down into the very fabric of our educational system.

If we are to successfully solve the ever-increasing pollution problem brought on by modern society, there is no question but that we must all have an increasing awareness of our environment and man's ability to live in that environment. There would appear to be no question but that we should begin at the primary school level and carry through into the universities, an educational program to help teach our youth how best to live on this earth. H.R. 14753 would be a major step in that direction.

Consolidated Edison Company's Programs To Protect the Natural Environment

INTRODUCTION

Consolidated Edison Company is committed to protection of the natural environment.

Environmental impact is a vital consideration in all Company planning. The Company has established an Environmental Engineering Bureau and staffed it with experts to coordinate and expand our environmental programs.

The following pages relate past, present and planned programs in the areas of air and water quality, aesthetics and noise control.

AIR QUALITY PROGRAMS

The Company has invested $150 million in capital expenditures for air pollution control equipment.

We switched to burning low sulfur fuels well in advance of legislative mandate, increased the use of natural gas, and reduced the amount of coal we burn. New air pollution control equipment was purchased and installed. Older coal burning equipment was either converted to natural gas or oil, or returned.

These actions according to statistics of the New York City Department of Air Resources, have cut Con Edison's contribution of sulfur dioxide by 55 percent and particulates (dust, ash) by 53 percent in the past three years.

For a more detailed look at Con Edison's air pollution control program, the Company's efforts in two major areas—sulfur dioxide and partciulate emissions—should be examined.

SULFUR DIOXIDE

By April of 1968, some three years ahead of the then existing legal requirements, all coal and oil burned by the Company was down to a sulfur content of 1 percent or less. The incremental annual fuel cost resulting from the purchase of higher quality fuels was and remains about $15 million per year. In addition, Con Edison petitioned for, and received, Federal Power Commission approval for increased allocations of natural gas to replace some of the coal and oil the Company was then burning. The amount of natural gas burned in Company boilers increased by about 28 percent to a total of 87 billion cubic feet in 1969. Natural gas is desirable as a boiler fuel because it contributes practically nothing to the atmosphere in the way of sulfur dioxide or particulate matter. Currently, Con Edison is utilizing as much natural gas as it can obtain. Increased availability would enable Con Edison to make further reductions in sulfur dioxide and particulate emissions.

PARTICULATE MATTER

Con Edison has invested about $70 million in electrostatic precipitators to control particulate emissions. The Company now has 6 electrostatic preciptitators in operation, all with guaranteed collection efficiencies of 99 percent or greater. Of particular interest in the group is the world's largest electrostatic precipitator, which serves the Company's one million kilowatt unit at the Ravenwood saion. This giant dust collector was installed at a cost of $10,000,000.

These precipitators, combined with the reduced use of coal and an increased use of natural gas and low sulphur oil, have reduced Con Edison's particulate emissions by 53 percent in three years. The Company is now contributing only 9 percent of the total particulates emitted into the City's air, according to the latest report from the New York City Air Resources Department. As a point of comparison, incinerators (apartment house and municipal) contribute 38 percent and space heaters contribute 32 percent.

In 1966 as Con Edison began to upgrade the efficiency of old precipitators where necessary, problems were encountered Low sulfur coal, utilized to lower sulfur dioxide emissions, reduces the efficiency of electrostatic precipitators Where precipitator improvements could be made, it was decided to convert these units to low sulfur oil or gas. These equipment conversions and upgrading have cost the Company approximately $15 million

THE FUTURE

Sulfur reduction

Con Edison is required by New York State law to use very low sulfur oil (0.37 percent sulfur) in all new fossil fuel plants constructed by the Company, such as its 1.6 million kilowatt plant expansion at Astoria, scheduled for completion in 1974–75. But beyond this, by burning the 0.37 percent sulfur oil in the existing Astoria units as well, we will be able to double total capacity while discharging 60 percent less sulfur dioxide and about 55 percent less fly ash than the present plant alone.

Con Edison is also continually reviewing all new sulfur removal techniques. These techniques would remove the sulfur from the fuel—coal and oil—before combustion or from the stock effluent after combusion. In addition, some use must be found for the recovered sulfur by-products.

To date, technologically feasible processes have not been developed which can be applied on the large scale necessary.

Liquefied natural gas

While demands for natural gas are increased in the nation, new domestic reserves have not been adequately developed. Realizing the air pollution benefits of natural gas, Con Edison has taken steps to alleviate any supply crisis. Besides continuous efforts to obtain greater quantities from the Federal Power Commission, we have begun to explore use of liquefied natural gas from sources outside the continental United States. Liquefied natural gas (LNG), a relatively new development, is gas maintained in liquid form at —260° F. with a resulting 600 fold volume reduction. The gas is stored in this state until it is needed, whereupon it is regassified for use in the system.

Nuclear power

Nuclear energy, at the present time, supplies only 3 percent of Con Edison's total energy output. The Company will increase this substantially by 1980, based on a commitment for construction of over three million kilowatts of nuclear generating capacity. Nuclear power for baseload (continuous demand) power generation, in combination with peaking (peak demand) power from the proposed Cornwall pumped storage plant, is the best long range solution for meeting the constantly increasing power demands of New York and Westchester County, while reducing Con Edison's contribution to overall air pollution problems. Because there is no combustion in nuclear power generation, there are no products of combustion to pollute the air. Thus nuclear plants emit none of the oxides of sulfur or nitrogen or particulate matter which are generated in the burning of fossil fuels (primarily coal and oil).

MHD

Another process for producing power, Magnetohydrodynamics, is often mentioned. MHD is a process whereby an electrically conducting fluid is passed across a magnetic field at very high temperatures to generate electricity. The primary benefits from MHD are a higher overall thermal efficiency (a more efficient use of the heat energy produced), as well as utilization of the country's large coal reserves. However, materials have not yet been developed to withstand these temperatures and, with current technology, these temperatures would produce significant levels of gaseous pollutants. Although MHD will probably not be feasible for large scale power production in this century, Con Edison is contributing research money toward the development of MHD.

Water quality programs

The current means of producing base load electric power on a large scale, nuclear and fossil-fueled plants, both require cooling water. Cooling water for the condenser of a generating station is obtained by pumping water from a river, lake or ocean into an intake pipe, passing it through the condenser and returning it to the source through an outlet pipe. The temperature of the water at the mouth of the outlet pipe ranges from roughly 10 to 25 degrees Fahrenheit above the temperature at the intake pipe, depending upon the amount of water available for cooling and a variety of design factors.

There are other means of cooling water from condensers other than using natural bodies of water—for example, cooling ponds, spray ponds, and cooling towers, both wet and dry. But, ordinarily, the most efficient and economic source is water piped directly from a river, lake or ocean, and returned directly to its source.

However, what is most efficient and economic for cooling the condenser may impair the quality of the natural body used for the cooling. The heat energy added to the water can cause problems if the speed and volume of the stream flow or tidal currents, or the method of returning the heated water, are such that the heat is not dissipated quickly. In a given case, the heat may or may not be dissipated quickly, and it may or may not significantly raise the temperature of the body of water to which the cooling water is being returned. If the temperature is significantly increased, this can contribute to diseases of fish or even kill some species; it can help propagate undesirable species, change the mineral content, promote algae, or affect the taste and odor of the water. Also, desirable effects can be produced in some cases, especially in northern climates, such as improving the oxygen content of water by reducing ice cover, or speeding up the growth cycle of shellfish, or improving swimming.

Con Edison's three Indian Point nuclear plants, when the second and third are completed and operable in 1973, will withdraw over 2 million gallons per minute from the Hudson River and return it to the river about 14° F. warmer.

The resulting temperature distributions in the river will be within government standards established to protect the river's ecology.

Very minute quantities of radioactive materials are also discharged into the air and into the Hudson as a result of nuclear plant operation at Indian Point. These discharges are regulated by the U.S. Atomic Energy Commission and carefully monitored by the Company and the New York State Health Department. Indian Point No. 1, which has been operating since 1962, has released only a small percentage of the maximum permissible concentrations set by the AEC. In fact, the quantities represent only a small fraction of the background radiation we are all exposed to daily.

A person living near the Indian Point reactor would receive only as much additional radiation during a year as he would receive in additional natural radiation if he moved his apartment from sea level to the 400 foot elevation in a building or if he took a round trip jet flight from New York to San Francisco and back.

Radiological studies and surveillance work in the Indian Point area are being carried out by the Institute of Environmental Medicine, New York University Medical Center. Plant and animal life from the river are being studied to determine if radiological releases in the plant's cooling water are having any adverse effects. Evidence collected has indicated that the radioactive release levels have not had a deleterious effect on the ecology in the area.

To determine the nature of thermal effects on the Hudson River, Con Edison has undertaken various studies costing the Company about $2.0 million.

1. In 1964, the Alden Research Laboratory of Worcester Polytechnic Institute built for Con Edison a scale model of the portion of the Hudson River adjacent to and including Indian Point Unit No. 1 intake and discharge channels. Second and third models have since been completed. These models have made it possible to study the combined effects of the three proposed Indian Point nuclear units on the Hudson River. The models simulate tidal, temperature and flow conditions in the river, as well as the volumes and temperatures of cooling water discharged from the units.

Results from the model studies have shown what temperature distributions would be in the Hudson River for each of the plants, as well as the combined effects. Although these findings revealed that Con Edison will be able to operate the nuclear units within the New York State Health Department thermal discharge criteria, which were instituted to protect bodies of water from possible deleterious effects of heated discharges, additional studies have been undertaken.

2. Northeastern Biologists, Inc of Rhinebeck, New York conducted a river temperature survey near Indian Point in July 1966 and April 1967 while Indian Point No. 1 was operating at close to maximum capacity.

These results were used by Quirk, Lawler and Matusky, environmental engineering consultants, in the preparation of a mathematical model which was used to substantiate that the thermal discharge criteria will be met.

3. Texas Instruments, Inc., has completed an aerial infra-red thermal survey of the Indian Point area of the Hudson River from Bear Mountain Bridge to Croton. The Raytheon Company is continuing with similar studies. The results have been, and will continue to be, used by Quirk, Lawler and Matusky to verify the results of their mathematical model, which predicts the ability of the Hudson River to assimilate waste heat.

4. A comprehensive Hudson River Ecology Study financed by Con Edison, began in June 1969. The program for the study was developed by a five-member Policy Committee (consisting of members from the New York, New Jersey and Connecticut State Conservation Departments, the U.S. Bureau of Commercial Fisheries, and the U.S. Bureau of Sport Fisheries and Wildlife). Field and research work is being done by the Raytheon Company. The first 19 months of the study, ending in January 1971, will cost Con Edison about $600,000.

This study is oriented towards an investigation of the effects of the waste heat discharges from Indian Point on the Hudson River ecology. The study will investigate, but not be limited to, the density and seasonal distribution of fish and key organisms; the separate and synergistic effects of temperature rise and chemical additives on the survival and behavior of fish and key organisms and the physical and chemical characteristics of the water area before and after the start of operation of each plant. The study will establish good base line conditions for comparison with past and future conditions in determining any adverse effects of our operations at Indian Point.

5. Con Edison is helping to finance independent ecological surveys in the Hudson River by the Institute of Environmental Medicine, New York University Medical Center. One year of the two year study has been completed. The study is determining types of biota and their characteristics, temperature measurements, and the chemical composition and turbidity of the river in the vicinity of Indian Point. The results will be used to determine what effect the operation of the three Indian Point nuclear plants will have on the ecology of the river in the area.

6. Con Edison will also initiate a "package study" survey in the vicinity of David's Island in western Long Island Sound, a potential future site for up to four nuclear units. This study will include the hydrological, meteorological, ecological, and radiological aspects of the area.

A Hudson River fisheries investigation in connection with Con Edison's proposed pumped storage project at Cornwall was recently completed and a final report has been issued. The study was financed by the Company and was carried out under the direction of a Policy Committee which contained the same members, with the exception of Connecticut, involved in planning the Hudson River Ecology Study. This study provided valuable background data on the area. The study indicated that only a small percentage of the total number of each of the life stages of striped bass present in the estuary would be subject to withdrawal.

In seeking the license for Cornwall, Con Edison indicated its willingness to restock any fish killed by operation of the plant. The same pledge has been made for the Indian Point nuclear plant.

In the search for long-range answers to the thermal effects questions. Con Edison will be engaging in a cooperative study with Westinghouse Electric Corporation directed at finding beneficial uses for waste heat in urban areas.

Noise control

While "noise pollution" is a relatively new topic nationally, Con Edison has been carrying out noise surveys of its plants and equipment for more than 20 years.

A special Task Force on Noise Control now coordinates the work of departments and recommends further noise reduction measures. A new Company noise code will include specifications for the purchase of new equipment of all types, and modification of existing equipment used by Con Edison and by contractors working for the Company.

Several recent noise control measures are noteworthy:

Con Edison accounts for only about one-third of street openings in New York City. Two-thirds result from the operation of other utilities (telephone, water, etc.) and construction. Quieter equipment to do this streetwork has been purchased and put into use on a pilot basis.

> Power take-off compressors, for use with air-driven jackhammers. Mounted inside a truck, they draw power from the truck engine, thus eliminating the need for a separate, noisy compressor whose sound rises and falls as the jackhammer operates. "Hydroville" pavement breakers, which use hydraulic fluid instead of air in their operation. Their compressors are quieter than air compressors. Moreover, because there is no air to escape from the pavement breaker during operation, they are quieter at work than air-driven jackhammers. Finally, the cutting bit of the "Hydroville" operates more quietly.
>
> The "cookie-cutter" pavement breaker, which is larger than the Hydroville, truck-mounted, and which makes a circular cut. Rotary motion permits the actual pavement removal to be done faster and more quietly.

Another interesting development has been the design of new manhole covers which expand and contract less than older, solid steel covers, and are quieter to drive over.

Aesthetics

In addition to providing reliable electric, gas and steam service to its customers, Con Edison strives to make its power facilities as presentable as possible, and to intrude minimally upon the natural and man-made environment.

We added to our staff last year an experienced architect to serve as Design Coordinator—a sort of inhouse critic of Company design policy. He is responsible for developing basic design continuity for all project proposals, both new and renewal, and to oversee the integration of the Company's engineering, economic and environmental responsibilities into new design expressions. He is adding a design dimension to our engineering economics that reflects concern for the total environment.

The following paragraphs illustrate how our concern is expressed in action.

Along the East River

Dismantling of ugly coal handling facilities along the F.D.R. Drive has been a major stride in opening the view of the water and skyline to motorists. At our 74th Street Plant, demolition of the coal handling facilities is complete. Improvements to the plant itself are scheduled for completion by June 1, 1970.

At our facilities on First Avenue south of the United Nations, the demolition of coal handling facilities is 70 percent complete. The removal of the coal towers and the bridge across the drive is expected to be completed by June 1, 1970.

At Our Kips Bay steam generating plant (35th Street) demolition of coal handling facilities is expected to be completed by September 1, 1970. We are building a small park along First Avenue. At our East River power plant (14th Street), demolition of the coal handling facilities has been completed. Adjoining this station are our East River ball fields. This area contains two Little League baseball fields and a combination football-soccer field, which are leased to the city on a no-cost basis.

Another program is to remove large cylindrical gas holders from various locations in the city, whenever the operation of our gas distribution system no longer requires them.

The East River beautification program is aimed toward making our service area a more attractive place to live in.

Generating plants

Vincent Kling Associates and Paul Friedberg Associates, two prominent architectural consulting firms, have been retained to assist in an architectural program at major generating plants. Friedberg is developing a master landscaping plan for our Indian Point Nuclear Station. Kling is now concentrating on our plans to expand our Astoria Generating Station.

The Astoria plans, for example, include "screen" plantings, that will produce a buffer strip along the major border of the property, a riverfront park and a children's playground.

Transmission lines

As of the present, 90 percent of Consolidated Edison's total transmission lines are underground to serve as unobtrusively as possible our 630 square mile service area. All of our transmission lines inside New York City and north through Yonkers are underground. We are in the process of rebuilding our existing overhead transmission lines in Westchester County to their maximum carrying capacity. We have pledged to Westchester County that when we have fully exploited existing rights of way we already own, we will acquire no new rights of way for overhead transmission; and that, thereafter, all Extra High Voltage lines in Westchester will be placed underground.

Meanwhile, we have begun to use transmission towers of the Dreyfus design and of our own design which, although more costly, present a markedly improved appearance.

Distribution lines

Since 1968, all new subdivisions of five or more homes in our service area have been constructed with electric service by underground cable. This was accomplished under a new policy whereby the Company completely installs—in residential developments of five homes or more—the underground system in the streets and furnishes the builder up to 100 feet of cable for the service connection from the street to each home. The effect of this policy has been felt primarily in Westchester County, but also in Staten Island and those sections of Queens, Brooklyn and the Bronx where new home building is taking place.

Substations

Frequent inspections insure that our substations are maintained properly. All new substations are constructed so they will be as unobtrusive as possible. In residential areas they are landscaped, and, in other areas, are designed to harmonize with the surrounding environment.

Parks for the future

Major park and recreation areas are planned for Indian Point, Cornwall and Davids Island. The completion of these is, of course, dependent on the completion

of our plants in those areas. However, at the present time, we maintain at Indian Point a lakeside recreation area, which includes a nature trail leading to the Hudson River. This area is frequently used during the summer months by visitors to our Indian Point Plant No. 1.

Mr. CONWAY. I would like to make some additional personal comments in support of your bill.

In connection with my present occupation and my former employment, I have had the opportunity on a number of occasions to visit universities and other schools around the country and I have been impressed by the interest of the students and their desire to take an active part in trying to improve their environment, and to understand their environment.

I am also impressed and somewhat disheartened by what I feel to be the ignorance I find among the students, and this even includes students in engineering schools, of the knowledge of ecology and some of the other sciences that go into the making up of the overall study of ecology.

Therefore it would seem to me highly desirable that some attempt be made to help educate these students who are so interested and who do so desire to make a contribution in this field.

I say that in connection with my efforts concerning atomic energy matters and concerning some of the benefits that I and my company believe will come about from the use of atomic energy.

Also, I had the responsibility of reviewing for about 12 years the annual AEC appropriation, and from my recollection there were each year some $16 to $17 million of AEC money that went into grants to universities and colleges around the country to help advanced students, postgraduate students, even postdoctoral students in the knowledge, techniques, technology of atomic energy.

I believe very strongly there is a need for money to go into aid to education at lower levels, secondary, and even primary levels of our school system.

I think there has been a tendency over the years to put Federal money into more advanced fields of knowledge which benefits a very small segment of the student body.

A bill like this, I think, would assist on a much broader base of helping to advance the educational qualifications of the students in our country.

That's one additional reason I would like for this bill to pass.

Mr. Scheuer, I am prepared to respond to any question you may have on the basis of that statement and the statement I submitted for the record.

Mr. SCHEUER. John, I appreciate your testimony very much. I want to state for the record that Mr. Conway for a number of years was executive director of the Joint Committee on Atomic Energy and, as such, he is a highly professional and highly skilled Capitol Hill hand.

Therefore I take your words very, very seriously.

Mr. CONWAY. Thank you, sir.

Mr. SCHEUER. And I appreciate your support, John.

Mr. CONWAY. Thank you, sir.

Mr. SCHEUER. I am impressed with your written testimony which I have reviewed. Much of it is technical.

I would like to ask you just one or two simple questions about the policy of utilities in general of stimulating demand for their product.

On page 3 you say, very rightfully, under present technology and technology foreseeable in the future there is no way of producing large amounts of electricity required by modern society without some effect on the environment.

Mr. CONWAY. That's correct.

Mr. SCHEUER. What you are saying is in effect what a number of us have been saying, that there is no known technology that we can produce electric power either by the fossil fuels or by atomic energy that doesn't have some negative environmental impact.

Mr. CONWAY. That's correct.

Mr. SCHEUER. Now this being true, is it in the public interest for utilities as a group to engage in institutional advertising with taxpayers' dollars, since they are tax deductible, encouraging more use of electricity, encouraging the electric toothbrush, the hair dryer and meatcutter and all nonessential gadgetries in which we are submerging ourselves?

Mr. CONWAY. Yes, let me answer as I see it, from the point of view of my company and how we handle advertisement.

No. 1, we do advertise. We do not spend however more money on advertisement than we do on research, which in other sections of the country apparently is the case.

An electric utility company, and I believe justifiably, can spend money on advertisement to the benefit of the consumer and I will give you the example of Con-Edison.

Con-Edison reaches its so-called peak—peak demand on its services—in the summertime somewhere between the hours of 3, and 4:30 in the late afternoon.

Last year for example in the worst day we had in the summer, we had a demand put upon us which was the highest in the history of our company, in the neighborhood of 7.3 million kilowatts of power demand.

By 7 or 8 o'clock that evening and into the night the demand fell off to less than one-half of that.

We find that the demand upon us is growing at about 375,000 kilowatts per year.

We must put in new capacity to meet that peakload. In some parts of the country they have a heavy industrial base, aluminum production, for example, which continues 24 hours a day.

We do not have an industrial baseload in this area. Therefore we have a heavy investment in capital equipment to meet the peak demand which lasts only a few hours each day.

When I talk about capital equipment, I talk about $200 to $300 million investment for a facility.

That facility must be paid for during the life of it, it must be amortized.

The consumer in the final analysis pays for the cost of that particular facility.

Now if we can get our night load up a little closer to our peak, and if we can get our winter load up a little closer to our peak—try to even it out—then the unit cost of the power becomes less.

Otherwise the electricity that's being used during that short period of time must carry the brunt, if you will, in paying for the whole plant.

We advertise electric heating, because that helps bring up our winter load.

But we also believe that if the homes are not heated by electricity, they must be heated by something else. They have to be heated, for example, by oil.

Mr. SCHEUER. A fossil fuel of some sort.

Mr. CONWAY. Some fossil fuel and, if you take individual burners per house, the actual amount of heat energy that's being obtained—the B.t.u. per pound of fuel burned—will be less than if you can do it all in a large efficient boiler.

It is more efficient, to do it in a single boiler.

So we think we can justify going to electric heat insofar as the overall environmental impact on the area is concerned. We believe it is helping the problems of the environment.

Similarly in lighting. We had an advertising program of "light a light, stop a thief."

We entered into that advertising campaign on the request of the city. This was an idea that originated with the city and from all reports it did help in cutting down on crime.

Again, this is off-peak load. As long as our peakloads are in the summer, you will not see our company advertising for air conditioning.

Now that is our answer—justification if you will—for advertising our product.

Mr. SCHEUER. How can you urge the selective and pinpoint use of additional electricity to coincide to your offpeak hours? Aren't you simply encouraging the use of more electricity, sort of scatter shot cross the 24 hours, which in effect is going to require you to increase your plant, increase the environmental fallout?

Mr. CONWAY. If you listen to advertising specialists—and I am not one—and our sales force, they claim to be very effective in how they can pinpoint a particular pattern. To pinpoint, we give special rates on electric heating, to make it economically worthwhile for the individual party or individual consumer to purchase equipment to use electricity during a given period of time.

So that's one way you can offer electricity and pinpoint for getting off-peak loads.

I have been asked several times when I am out on the campus, "Shouldn't you be advertising for people to cut back on their use of power and telling people not to use air conditioning?"

Well, by law electric utility companies are required to meet the demands put upon them and there's no question of the demand going up; we are doubling it nationally every 10 years; somewhere, sometime we have to stop that geometric progression. Maybe the time is either here or getting close.

I answer, however, I think it would the height of arrogance for a utility to tell consumers that they should not be using any more of their product, "that this is as much power as we are going to produce and we are going to stop at this level and you have to work out some way of apportioning its use."

That decision I think has to be made by the citizens themselves, operating through the legislature, operating through the body politic. But it is something I don't believe should be put upon the utilities, because I think it would be arrogant for them to assume that responsibility.

Mr. Scheuer. You are sort of kicking a dead horse. I am not saying utilities should tell people not to buy electric toothbrushes, but they should cease and desist urging them to buy an electric toothbrush, and they might have sort of Smokey the Bear kind of advertising saying, you know, additional electricity costs us in dollar terms and in social terms and think about it.

Do you really need it?

Obviously you can't tell people you are not going to deliver the power. But it seems to me you are putting the worst possible face on it.

Mr. Conway. Right. I have been taking it to the extreme.

Mr. Scheuer. Reductio ad absurdum.

Mr. Conway. Yes.

Mr. Scheuer. How about some institutional advertising telling people what you say on page 3, that there is no foreseeable technology where electricity will not produce negative environmental fallout and just saying "Go easy"?

The liquor companies say it. They say, "If you drive, don't drink; if you drink, don't drive." And they are saying to people in effect under certain conditions desist from using our product.

Mr. Conway. Right. I have two comments.

Con-Edison does not participate in institutional advertising since Charles Luce took over.

Mr. Scheuer. Right.

It could even be humorous, like, "Look what this is going to do to us. Stop, look, and listen."

Mr. Conway. Mr. Congressman, there are some in the company who have advocated a policy along this line.

In my mind, for example, I question the use of electric windows in a car. It is easier for me to turn a handle around. It is much more efficient for me [indicating].

Mr. Scheuer. Now wait a minute, John. Off the record.

(Discussion off the record.)

Mr. Scheuer. Could you list some of the items you would consider sort of nonessential in the larger uses of electricity?

Mr. Conway. In my own mind the electric toothbrush—which I don't use personally—but my dentist tells me I ought to use them—but I would prefer in this New York area there would be a cutback in the use of air conditioning in the summertime.

However, I find it very difficult to go out and tell somebody who has to stay in this city during the summer and can't go up to the Catskills or Adirondacks, or anywhere else, that he can't have this type of comfort.

I would like to see less use of it in the summer because that's when we have our problems in our particular area.

But in the case of, as I say, electric heating or lights, we feel we can justify it. I find the lighting by electricity, for example, helps the students in their reading.

We are warned constantly by doctors and eye experts that students should have better lighting when they are reading.

Mr. Scheuer. We are all agreed on that. But how about the nonessential uses, the electric hairbrush or the electric meatcutter?

Mr. CONWAY. No, I would not think that's an essential use. I don't have it in my house.

On the other hand, it is argued by those who are advocating the use of this, usually they are the manufacturers of a particular product, that it is essential for the housewife.

If you took the incremental additional use of electricity that these would cause, it would be fairly de minimus.

However, the use of electricity has been going up at a fairly rapid rate, much faster than population.

Mr. SCHEUER. What's the component? Is it industrial, homes, air conditioning?

Mr. CONWAY. In our particular area here it's air conditioning, basically.

Mr. SCHEUER. Business or homes?

Mr. CONWAY. Both. When doing some studies after Charles Luce became chairman of Con-Ed, we went back 10 years to see what were the projections of this company for 1969. Surprisingly for this last summer, if you go back 10 years ago they were projecting it quite accurately. That was the projected growth.

We have now projected for the next 10 years. We have laid out a plan how we hope to meet that projection. We have disseminated it to the public service commission, the Governor, and the mayor. We say we foresee this as being the demand on us the next 10 years providing nothing interferes to stop the orderly progression of the use of electricity in the New York area.

We also set forth how we plan to meet this growth. For example, in New York City, the amount of new office space in the next 4 or 5 years, that is either under construction or committed, will require the equivalent of slightly over 1 million kilowatts of additional electricity.

That's the equivalent of one new, large sized nuclear power plant, just to meet the increased demands by new offices going into New York City. That's a significant increase.

Yet our rate of increase is not going up in the 630 odd square miles we serve, as fast as in other parts of the country.

Puerto Rico for example is doubling every 5 years; when you talk with the people in Puerto Rico who have the responsibility of meeting that increasing demand it is a tremendous problem they have of trying to find new sites and build new facilities.

The normal construction of a new fossil plant, we figure will take 5 years from the time we decide to go ahead until it comes into operation. Nuclear plants run about 7 years to construct.

Our new pump storage at Cornwall plant is taking us more than 10 years.

When you add the regulatory reviews, you have to plan far in advance. As I say, I don't envy the authority in Puerto Rico that has that responsibility.

Mr. SCHEUER. If you had total power over decisionmaking, what national powers would you advocate, at least to slow down the rate of increase, policies that would be consistent with our democratic way of life?

Mr. CONWAY. That's a tough one and I can't know whether I could come up with a solution——

Mr. SCHEUER. Education policies and regulatory policies.

Mr. Conway. Yes.

The point is, I say I wouldn't be able to come up with a solution I believe that would meet or receive the acceptance of everyone.

I think there is no question in the matter that we have got to find solutions starting in the regional areas first, because I think it's easier to work on that basis.

But I think in a final analysis we will have to come to a national basis for making decisions. How we wish to grow in those areas, what type of power facilities we are going to place and where we are going to place them.

It means setting up a regulatory procedure in which we have to, put in one body the capability of analyzing the pros and cons as to one form of fuel versus another, one site versus another and——

Mr. Scheuer. One form of energy, don't you mean, versus another rather than fuel?

Mr. Conway. Right. I have to get energy, and from energy I have to decide how I'm going to get that energy and which fuel to use.

We are going to have to decide as to our streams, which streams, which rivers we want to save for recreation, for fishing, for what kind of fishing, for commerce; we have to be selective on this because we cannot use all of our facilities, all of our assets for every purpose.

We do this constantly on a zoning basis in the cities.

In the cities as they get more crowded we start zoning and then the counties begin to zone. We are at the point in the national area and no question we are moving into the international area. We have to do what the large cities and small cities do—zone, not only in the use of land but also in the use of fuels and the use of energy.

Mr. Scheuer. Are there any national policies, either educational policies or regulatory policies, that would dampen somewhat the increase in the rate at which we are consuming power?

Mr. Conway. Well, let me say this. It concerns and I think it should concern us, the demands upon the use of electric power.

I see on the other hand some of the things that go with the inability to have power and problems inherent in lack of electricity.

For example, in parts of India, in parts of Pakistan and even some of the remote areas of Russia—I spent 3 weeks in the remote Siberian areas of Russia——

Mr. Scheuer. When did you do that, John?

Mr. Conway. I did this about a year and a half ago when there were some hearings in Novosibirsk on fusion; they had scientists from all over the world and Dr. Gerard Tape headed up the U.S. delegation and invited me to accompany him—at the time I was still on the Joint Committee. When you see in some of these remote areas the problems they have of not having enough energy and the effect on the people who have to work. I have seen in India when they were building the Tarapur nuclear reactor, women were making the equivalent of 1- and 2-cents-a-day carrying rock on their head to move rock out of the area.

You see these people hardly more than beasts of burden.

Mr. Scheuer. You seem, John, again to have a real talent for going with unerring instinct to reductio ad absurdum.

We have the Woman's Liberation Movement in this country that would prevent that kind of limitation to electric power.

Mr. CONWAY. Recently, I was at Columbia Law School debating this question with some conservationists. We were in a beautiful room like this, well lighted, air conditioned, with no windows.

Years ago it was different. We went during the summer, to try to make up time after World War II in the old Columbia Law building.

Mr. SCHEUER. You find they didn't have an elevator.

Mr. CONWAY. That didn't bother me, because I was in better shape then than I am now but the windows had to be left open because of the hot, heavy August days of New York and we had no air conditioning. The dirt and noise came in.

Which would I prefer? No question which is more pleasant for a student.

Is it essential to study with air conditioning and in a quiet well lit building at Columbia Law School? Maybe some of us would have been better lawyers if we had the same. I don't know.

But I personally do not believe we are at that stage in the U.S. today where we have to stop additional uses of electricity, because I still believe and I say this without having the available facts, that the alternatives are less desirable.

Now we are getting, we have to get to the point where we can't keep doubling our electric production every 10 years. FPC chairman, John Nassikas in his testimony in Congress, stated we are going to have to build an additional one billion kilowatts installed capacity by 1990.

We will have power plants all over the place and no place for you and me sto stand if the United States continues indefinitely to double its demand every 10 years.

We have to level off at some place. What that point is I don't know. I don't think we are at it in this country as yet.

We may be coming very close.

Mr. SCHEUER. Well, I am simply asking you and I don't want to press it if I can't get an answer. Are there any national policies you can think of, either legislative or education policies for consumer action, different consumer pattern that would dampen or diminish somewhat the rate at which we are increasing our consumption of electric power?

Mr. CONWAY. Yes, sir, I think there are ways of having the same results by getting more energy per unit, of B.t.u., of fuel consumed. In a single apartment building, for example, instead of each and every one of us having our own individual unit, it is more efficient to have a central air-conditioning unit, to have controls in each apartment, to educate people to turn it off when it is not being used, to try to use the power of electricity only when you need it.

Personally I was brought up at a time when as a boy, when I left the room I turned the lights off. If I didn't, my father used to say: "Are you working for the electric company?"

But we have to teach people to do that, not to waste electricity, because every time we leave lights on when we are not using them really we are wasting a national asset. We are wasting the fuel that produced the electricity, whether it is coal, oil, or nuclear.

Mr. SCHEUER. And polluting the environment.

Mr. CONWAY. And polluting the environment. Don't waste energy.

Mr. SCHEUER. Right. I understand Lyndon Johnson used to turn off the light bulbs in the White House to enhance the environment.

Mr. CONWAY. Right.

Mr. SCHEUER. Is there anything else you can think of in terms of a national policy?

Mr. CONWAY. I think your bill here is helpful along that line. I think your bill would improve the educational level by teaching people at the primary and secondary level and carrying on through to adulthood about their environment and how to improve their environment.

From the point of view of the electric utility company this would be highly desirable and for the youth and the public to understand how power is produced.

With a better understanding it is going to be easier for us to meet the demands put upon us and, if we find a place or site for a plant, and they will better understand what alternatives we have.

So I think a bill like you have sponsored here would be highly desirable along that line.

Mr. SCHEUER. John, let me ask you two questions.

The first one is impossible, the second one may be possible. How do you teach teenagers to turn off the light?

Mr. CONWAY. You have to stay on them constantly and be right behind them. Usually you turn it off for them.

Mr. SCHEUER. I have two teenagers and subteenagers and they look at me like I am creepy: "You don't have to turn off the light in Metropolitan Washington."

Mr. CONWAY. I have that with the telephone. I tell them, "You don't have to be constantly using the telephone."

Mr. SCHEUER. Secondly, how do you educate technicians?

You are a very first-class technician, professional especially in the field of engineering. How do you educate engineers who are educated specialists. There are hydraulic, mechanical engineers, there are electrical engineers. They aren't even educated as engineers. They are educated in degrees of engineering specialties.

How do you educate engineers and architects and the professionals who create the capital plant of our country, the bridges, the highways, the roads, the industrial systems, to be sensitive to the environmental fallout of those systems that they are designing and to include in their design, without mandate of law—and you know the law is not all that effective—it can only do minimally what can be done much better at earlier stages—how do you get the technicians who are designing the facilities, the plant, to include in their cost benefit analysis as well as in their design what ought to be put in what will enhance the total product from the environmental point of view and minimize whatever environmental fallout must necessarily flow?

I know that a road has to have some negative environmental impact, a bridge does, a housing project does, unless it is unusually creatively designed, a powerhouse.

Now, how do we build into the program engineers and technicians who are sensitive to the fallout they are producing?

Mr. CONWAY. I think the point you make is very well taken and the question is rightly asked.

When I was in school studying I was basically a mechanical engineer but I did have to take courses in electrical and civil engineering, but we had no course in the field of ecology.

If anyone had used the word, I don't think I would have understood what it was. We had no attention directed along that line.

In fact engineers in the early days gave little or no attention to what we would today call beautification.

Mr. SCHEUER. Of course, the word "ecology," has nothing to do with beautification. Essentially it comes from the Greek, "Oikos," which means the house we live in.

It's the housekeeping concept and its sphere is our home.

Mr. CONWAY. We have seen at least in the electric utility field, the last 10, 20 years an evolution in the education of engineers and technicians. We try to have them be more than just technical experts or to approach problems just solely from a technical point of view.

We began to recognize the need for powerplants to blend into the area and to be more pleasing to the eye.

We now take into consideration esthetics and that's been an educational process.

We are now at the stage and already past the stage where environmental considerations have to be taught and understood.

We should start at the primary school level.

Mr. SCHEUER. We had young students in here this morning from Bronx High School of Science and they were complaining there wasn't any course on environment or ecology, and they wanted it.

Mr. CONWAY. I went to Bronx High School before it was called that, when it was the old DeWitt Clinton Annex.

Mr. SCHEUER. And that was a great high school.

Mr. CONWAY. When you get down to it, the proper study of ecology is really a moral question.

At school and even at home the children should be taught ethics and morality and, as the student moves along, by the time he goes into law or any professional field, he has been taught over the years standards of ethics which really is how you live with your neighbor. Really, when you get down to it I would suggest that in the final analysis that is what it is—it is ethics and morality.

Mr. SCHEUER. "How do you conserve your house?" as the Greeks put it.

Mr. CONWAY. Very good.

Mr. SCHEUER. Well, how do we get that into the engineering schools?

Mr. CONWAY. I was an engineer as an undergraduate but I left it right after I graduated from school. So I have been more of a lawyer than I have an engineer. But in defense of engineers, my experience has been that once they get the idea, an engineer or a scientist is more adaptable to this way of thinking than others.

In C. P. Snow's concept of two cultures, I find it's easier for the technical man to cross the bridge and pick up the other side and he's usually willing to do this.

I am concerned a great deal I think on the other side of it, the liberal arts student and the lawyer—their inability to cross the other way and understand the technical scientific field. We really have to have both sides understand the other.

I think we can teach engineers and I think they are learning, they have been learning.

But on the other hand I find that many of those who are well motivated—and I have said this up at Columbia Law School—the lawyer who wants to get in there and wants to correct things too often is ignorant. He says, "I want to stop thermal pollution of the water, this is wrong and we have to stop it." We may recommend and we may draft laws that can and will eliminate or prevent the thermal pollution of the water.

But it may cause worse effects, unintentional effects if we really don't understand the technical, scientific facts of life.

In my limited experience in this field, I find it has been more difficult for me to get the nontechnical man to understand the technical facts than vice versa.

But there is a problem both ways.

Mr. **Scheuer.** Now there is on the law school campuses of America a real movement for advocacy law in the field of environment and ecology. They're bringing all kinds of cross curriculums and trying to bring new cases in law.

Is there anything corresponding to that advocacy law in the field of engineering? Is there advocacy planning, architecture, going on at the schools?

Mr. **Conway.** I believe there is, but I honestly don't know. I haven't been that closely involved in the curriculum of an engineering school.

I have, however, been talking with young engineers, young engineers coming into our company and others that I have run into around the country and young scientists who very, definitely are involved.

Mr. **Scheuer.** They are beginning to think of these things?

Mr. **Conway.** Very definitely.

Mr. **Scheuer.** As activities?

Mr. **Conway.** Very definitely.

Mr. **Scheuer.** Well, John, you have left us with a ray of hope. Thank you very, very much for your testimony.

Mr. **Conway.** Thank you.

Mr. **Scheuer.** Thank you very much.

Professor Vinci, would you take the stand?

Professor, we are very, very happy to have you here today.

STATEMENT OF DR. THOMAS VINCI, ASSISTANT PROFESSOR OF EDUCATION, FORDHAM UNIVERSITY

Dr. **Vinci.** Thank you.

Mr. **Scheuer.** And you have a prepared statement. If you wish, we can include this statement in the record.

Dr. **Vinci.** Well, I really don't know your format. This is my first experience before a select subcommittee.

Mr. **Scheuer.** Why don't we reproduce your testimony at this point in the record in full and then have you chat informally to us.

Dr. **Vinci.** That would be fine.

Mr. **Scheuer.** All right.

Dr. **Vinci.** Have you read this?

Mr. **Scheuer.** Yes.

(Dr. Vinci's prepared statement follows:)

PREPARED STATEMENT OF DR. THOMAS VINCI, ASSISTANT PROFESSOR OF EDUCATION, FORDHAM UNIVERSITY

My name is Dr. Thomas Vinci. I am an Associate Professor of Education at Fordham University, Lincoln Center Campus. I am the Coordinator of the Apprentice Teacher Team and Supervisor of Apprentice Teachers. I also teach a course on the Problems of the Beginning Teachers. I have had 21 years of teaching and supervisory experience as an elementary school teacher in the New York Public School System and as Science Coordinator in the District Superintendent's Office of District 6.

The bulk of our population now lives in cities and statistics reveal that our cities are growing at a rate two to three times as rapidly as the surrounding suburbs. Our city children know little about grass, shade trees, and winding roads. To them, nature means dodging speeding cars, avoiding broken bottles, and scavenging among the refuse that litters empty lots and backyards. They hardly notice any more, the thick smoke that pours from the chimneys about them. On bright, sunny days, it is not unusual for the blue of the sky to turn into a murky gray. In New York City, and in most urban centers, this is a way of life—unfortunately an accepted way of life.

Obviously, the government agencies have a responsibility to see to it that all of us, including our city children, have a right to breathe clean air once again. Educationally speaking, those in the field of teaching also have a responsibility. Our responsibility is to see to it that our urban children see nature as we have always remembered it to be: trees that bear foliage, bushes that really blossom, rivers free from floating cans, and a butterfly in sight. In the past, as today, the teacher did the following to bring nature closer to the city youth:

1. We planned trips to zoos, museums, parks, and other educational resources.
2. We are still using curriculum bulletins such as *Operation New York*. These bulletins describe how our urban environment may be studied; they help children notice the natural stone found in the school building, the composition of the sidewalks, gutters, curbstones; they help children notice their neighborhood—the vacant lots, excavations, local parks.
3. We are using Instructional Profiles—a practical curriculum in science published by the Center for Urban Education that can be handled easily by a teacher who is not a specialist in science. Much use of the child's immediate environment is made in these Profiles—the schoolroom, the schoolyard, the neighborhood, and the community are utilized wherever possible in order to develop children's careful observations and classifications of data familiar to them and relevant to them.
4. Educational agencies such as Wave Hill Center for Environmental Studies and High Rock Park Conservation Center have organized courses of study and techniques for dealing with the problems of our environment.
5. Professional associations such as the School Garden Association and the Elementary School Science Association of New York City have highlighted their programs and focused on the problem of environmental education.

The above-mentioned attempts to bring children from inside the classroom to more relevant learning about the streets and communities in which they live are a good beginning, but much more must be done.

If the problems of environmental education are to be solved (and they must be if our cities and our nation are to survive), the solution will come through the efforts of capable, understanding, and imaginative teachers who must possess the needed education, techniques, and resources necessary for the training of our city dweller. The colleges have the primary responsibility since they are the trainers of these teachers who must implement the programs which must be introduced into the city schools. Preservice and inservice courses must be initiated to meet this high priority need. These courses would not be of the "crash program" variety nor temporary in nature with stop gap measures and a piecemeal approach, but rather would have a coordinated structure with short and long range goals. It would be the primary responsibility of the university to research and coordinate all the existing studies and programs and organize them into a logical sequence of courses to insure the continuity of the program in environmental understanding and appreciation. Special focus of this program would be effective teaching, sensitivity training, changing attitudes, and understanding group processes.

Presently, I would say that very little worthwhile science instruction is taking place in elementary schools across the country. The reason for this is that the common branch teacher has always felt most inadequate in this curriculum area.

We have an opportunity now, because of the great concern for the safety of our environment, to hurdle this fear and begin a truly sound teacher training program in the area of natural science.

This program would include the training of teachers to help them make each pupil aware of pollution, litter, and destruction that surrounds the child, that surrounds his school, his home, and his community. Also, the teacher should help show each child how his environment affects him personally—how it affects the child as part of a group—part of a class, a family, a community—how the fumes from the car on his local street could eventually cause lung damage, how the litter in the street, the uncollected garbage breeds rats and contaminates the air, how the destruction of buildings, trees, and parks can rob him of an emotional sense of pride in the aesthetic beauty that should surround him, how the noise can unconsciously irritate him, causing hostility within him, and possibly damage his hearing. The damage pollution can cause must be made relevant to *him*. The child must be taught that he can do something to contribute towards the betterment of his environment—both as a young individual and as an adult member of a group and a community.

The university must define process and content goals in preparing teachers to teach about the environment. How can we do this? This can be done by organizing a syllabus, working with para-professionals, by applying new approaches, by understanding child development and child readiness. We on the university level have the responsibility to train teachers in the arts of motivation and scientific inquiry so that the classroom can become an exciting, living laboratory, a laboratory that is directly related to the level of children's experiences. This is what I meant before when I said that pollution must be made relevant to the youngster.

Preservice and inservice courses would include opportunities for the active involvement of student teachers and beginning teachers in outdoor living experiences. Field trips of one to two weeks duration would involve college students, children, college instructors, and key community persons in camping out so that all would discover, understand, and appreciate first-hand the natural environment.

In addition, opportunity for active involvement of students and beginning teachers in the many environment resource agencies by having them serve as trainees and adjunct instructors in zoos, museums, and parks.

Opportunity should be provided for active involvement of students and teachers for working with community representatives, parents, and para-professionals so that there can be a logical tie-in between that which can be taught in the classroom and that which must be carried on in the neighborhood.

It is only natural that Fordham University's School of Education, situated in the heart of the metropolis, should be intensely concerned with environmental education. Better education is indispensable to any overall program when any American city attempts to deal with its pressing problems. Although environmental problems cannot be solved by the school alone, they cannot be solved unless the schools are functioning effectively, answering the wide variety of educational needs of an urban community.

Fordham University thinks it important to develop new patterns to prepare the teacher and related professional personnel so urgently needed in urban schools. We expect the schools and the University to work together with the community in the education of teachers to improve the education of children already in the schools. We want to invest them with the drive and the ability to help plan new educational programs in environmental education to meet the needs of a national crisis.

Dr. VINCI. What I am trying to show here is what has been done in the past and is being done here at this time, and what I think should be done in the future. How teacher training institutions help in teaching children, through adults to become cognizant of what is happening in their environment, and what to do about it.

Whatever questions you would like to ask I would be most happy to answer.

Mr. SCHEUER. Well, I take it you have read our bill or you have glanced through the bill.

Are there any improvements you can suggest? Do you have any criticisms of any aspect of it?

Dr. VINCI. I would like to see it passed, because I feel that money is what is needed at this time.

You can see from my presentation here that we have had little pockets or oases in the school system trying different innovations: 25 children going to the country for 1 week from Harlem, let's say, but what about the thousands who never see the countryside? And that takes personnel, money, and understanding what resources are available.

Mr. SCHEUER. I don't want to put words in your mouth. Do you feel that curriculum materials can be developed using closed circuit television?

Dr. VINCI. Television would be one way.

Mr. SCHEUER. And using computerized learning and all kinds of audiovisual materials to teach the impact of personal decsions and large-scale industrial decisions on the environment?

Is environmental education susceptible of elaborate autovisual presentation?

Dr. VINCI. Well, these would be vehicles in which a child could participate and it would make it easier for a greater number of children to participate.

Actually I see this as a large emphasis.

In other words I don't see it as a hit-and-miss proposition where you will do it here today, or on Earth Day 1 day a year when we will stop the cars from rolling on Fifth Avenue.

All of this is fine. You focus attention on the problem.

But what happens next year, the year after that? This will die out and in 10 years or in 20 years we might not be around to do something about it. I have written a curriculum, through the center for urban education. Just for urban children to deal with their environment. This is being tried out at the present time in several areas of New York City.

But because of cost, possibly 20 or 24 classes are trying it out in the entire city of New York. So really we are not hitting every one. We have good ideas but one class does it here, one college class does it there and that's where it ends.

Mr. SCHEUER. Yes.

Dr. VINCI. And if we can take and do some research first and research what is being done throughout the entire country, and abstract from these studies, and projects, the best and then put them into operation and set up a schedule or a program here in New York City. That would be fine.

Mr. SCHEUER. Professor, on page 5 you mentioned the use of paraprofessionals in environmental education. You say the university must define process and content goals in preparing teachers to teach about the environment: this can be done by organzing a syllabus, working with paraprofessionals, by applying new approaches.

I happen to be, in addition to being an original sponsor of this bill, the original sponsor of the careers program which, you know, involves the training of paraprofessionals in all branches of public service.

How do you envision using paraprofessionals in environmental education programs?

Dr. VINCI. I think the paraprofessional is one of the most important links, in fact it is the link between the schools and the community, because the paraprofessional comes from that community. If the teacher says something to a child, they see him as a teacher; but the paraprofessional goes shopping where the child shops, walks on the same streets.

If the paraprofessional says or encourages the child to do something in a certain way, this will be more apt to be done.

Whether the teacher is black or white, the paraprofessional can help bridge the gap between teacher and child.

Mr. SCHEUER. In other words through his ability to communicate his rapport with the neighborhood child.

Dr. VINCI. He speaks the same language.

Mr. SCHEUER. Yes, and we have about 10,000 paraprofessionals in New York City, about 11,000.

I am trying to get the board of education to negotiate their people. 10,800.

Dr. VINCI. And I have argued the point that the 1.75 or 2.25 is inadequate because many of the paraprofessionals take the children and teach them remedial reading and in many cases they are good—and in many cases the paraprofessional relates better with the children and does a better job with the children.

Mr. SCHEUER. Do you have any other comment or criticism about the bill? Anything you would like to have or say?

Dr. VINCI. No.

Mr. SCHEUER. Well, Professor, thank you very much for your testimony. We thank you very much.

Mr. Joe Moore is vice president of Eastman Dillon & Co., I met Mr. Moore in San Francisco a few months ago where he made a notable contribution to the UNESCO conference on environment, and I asked him if he would be willing to testify when we had our hearings on this bill.

He has graciously consented to do so. We are very happy that you are here.

STATEMENT OF JOE G. MOORE, JR., VICE PRESIDENT, EASTMAN DILLON, UNION SECURITIES, INC.

Mr. MOORE. My name is Joe G. Moore, Jr., and I am vice president in municipal finance for Eastman Dillon, Union Securities & Co., New York.

I appear here today as an interested citizen and former Commissioner of the Federal Water Quality Administration.

I assume this statement can be put in the record.

Mr. SCHEUER. Yes, your statement will be printed at this point in the record in its entirety prior to your testimony.

Mr. MOORE. Yes.

(Mr. Moore's prepared statement follows:)

STATEMENT BY JOE G. MOORE, JR., VICE PRESIDENT, MUNICIPAL FINANCE, EASTMAN DILLON, UNION SECURITIES & CO.

My name is Joe G. Moore, Jr. and I am Vice President in Municipal Finance for Eastman Dillon, Union Securities & Co., New York. I appear here today as an interested citizen and former Commissioner of the Federal Water Quality Administration.

Practically all my working experience until February 1968 was in the field of state government as a legislative research assistant in taxation; administrator of the workmen's compensation insurance program for those injured in industrial accidents; a consultant in the vocational rehabilitation of the industrially injured; as finance examiner for the agency charged with coordinating the State's higher educational institutions; and administrative assistant to two governors in the fields of budget, taxation, public and higher education, and water. Water issues became a prime concern of mine when I assumed the duties of Executive Director, Texas Water Development Board, on September 1, 1965, responsible for developing a comprehensive statewide plan for water development to meet the people's needs to the year 2020. In that capacity I also served as chairman of the Texas Water Quality Board, the agency charged with preparing standards under the Federal Water Quality Act of 1965. Effective February 1, 1968, I was appointed Commissioner of the Federal Water Pollution Control Administration by then Secretary of Interior Udall. I have been with Eastman Dillon since June 1, 1969. My educational preparation includes B.A. and M.A. in government and 82 hours of law, most of which has been completed at the University of Texas.

What I say here today represents my own personal views and restates and elaborates opinions I have expressed in private correspondence on several occasions.

Environmental utilization is primarily a choice between competing alternatives. Various uses result in both valuable end products and impairment of the environment. Hardly any natural resource can be used without some damage to the environment. Traditionally, there has not always been a weighing of the detriments against the advantages. Where there has been a real, conscious attempt to measure and weigh these elements, environmental detriments have been given such low values that the return from exploitation has in the past outweighed the potential environmental damage.

Further degradation of our environment, further disruption of the earth's ecology can be halted and effective restoration achieved only if we understand the interrelationships of the natural world. The interwoven life cycles and food chains of all the world's creatures are probably as complex as any scientific marvel man has ever attempted to understand.

Assistance and programs such as those contemplated in H.R. 14753, the "Environmental Quality Education Act" should accelerate both the understanding and achievement of a better environment.

Education in environmental science must be multidisciplinary since so many effects of man's activities can be fully evaluated only by applying the knowledge possessed by a number of educational specialties. Experience in recent years also provides evidence that environmental effects are often subtle and cumulatively damaging for the long range while they may be initially undetected. Thus, means must be found to detect these changes as they occur; detection will require the concentrated application of expertise acquired in an educational exposure to many areas of knowledge.

One of the major deficiencies of current "interdisciplinary" programs, in my view, is that they are too often superimposed, umbrella fashion, upon existing academic departments. Functional, specialized, historic and traditional disciplines being what they are, jealousies and rivalries are sometimes so strong that this is the only way a program can be structured. Each of us is the product of such a compartmentalized system, under arrangements of long standing strengthened by the weight of tradition. Academicians produced by the system and functioning within it have difficulty standing outside the system and viewing it objectively. Thus each specialty tends to see an environmental program with its specialty paramount and all others subservient or at least all specialties co-equal so that none of the other specialties gains a superior role. This tends to make integrated environmental or urban programs "*inter-*" rather than "*multi-*" disciplinary.

I would hope programs receiving support under legislation such as that in H.R. 14753 would be concentrated in those colleges and universities that have done more than change the name of the Sanitary Engineering Department to a Department of Environmental Studies. I would like to see a new kind of academic department staffed by a multi-disciplinary faculty responsible directly to the department head rather than a group of specialists responsible first to their specialized department heads and secondarily to the head of the environmental studies department. Personally, I believe "who" is selected to teach in such departments is equally as important as "what" is selected to be taught. To me, the most effective specialists in this field are those with some understanding of, and appreciation for, other specialties that can make a contribution. If these persons must be descriptively named, I would call them "specialized generalists" possessing both a specialized background and a general knowledge of, and continuing curiosity about, related specialties. The "specialized specialist" will belittle other specialties as they might relate to the environmental problems and convey the impression that his specialty is really the one that makes the major contribution to solving the problem.

Since I am now associated with the investment banking community, I will comment on the role of economics and public finance in such an integrated approach to the study of environmental problems. One of the major considerations often lacking from presentations of major public policy issues is comprehensive discussion of costs or financing alternatives. Costs more often receive attention than do means of financing. Today, however, the socio-political decisions are increasingly impacted by cost and financing considerations. Proposed solutions do not get much attention without cost questions being raised. Advocacy of various solutions should include cost and financing analyses.

With increasingly sensitive appreciation for the quality of our environment and because scarcity of an undefiled environment enhances its value, in the choices between natural resources utilization and environmental damage the scales are currently often tipped against resource use. The real controversy now centers on those natural resources already damaged—whether they should be restored, if so, how? and who should pay restoration costs. How can land ravaged by surface mining be recovered and at whose expense? How can the adverse effects of acid drainage from abandoned surface and subsurface mines into our water courses be halted and who should pay? How can the quality and esthetics of our water-courses be regained and who should pay? How can we reduce the massive discharge of pollutants to the air we breathe arising from our own industrial and domestic activity and who should pay? You will note that these questions require analysis, i.e. some feasible means for correcting the situation; evaluation, i.e. some yardstick for measuring the cost; and choice, i.e. a selection of the means by which payment shall be made. These determinations and their succesful implementation require a wide range of talents—technological, economic, and socio-political. Ideal technological solutions are slow in being effectively applied unless they have adequate political backing. Acceptable scientific remedies with strong political support will fail unless the economic bill is paid.

Cost alone should not be determinative, however, i.e., neither the economist nor the public finance expert should be permitted to make the ultimate choice based exclusively on the application of his expertise—just as the choice should not be left to the industrialist, the biologist, the wildlife expert or the conservationist. Nor should those involved in costs and financing be allowed to tabulate the costs and benefits utilizing only tangible or assessible factors. Cost-benefitting is not yet an exact science. Public finance experts tend to want all factors reduced to mathematical terms. Stress on computer capability tends to promote the idea that all questions can be reduced to precise terms and the "correct" or "proper" answers or decisions factored by formula. Such an assumption might be valid if the world were populated by machines rather than people. Here again, there is a risk of economic and financial oversimplification.

Furthermore, values are fluid—not static, and economists are sometimes slow to recognize new values. Since man's values and needs change, what is "uneconomic" or "too costly" today may be economic or "cheap" tomorrow. Economics is relative and even economists aren't always aware of the relationships and their changes. People today will pay a much higher "cost" or forego much more economic benefit to protect the environment than they would a decade ago. One of the traditionally accepted uses of water has been dilution of untreated wastes and of waterways has been as transporters of untreated wastes. These uses no longer enjoy substantial support. An "esthetic" use of water, very difficult to quantify or evaluate, is receiving increasing recognition.

Here we identify another educational need to which H.R. 14753 is addressed. educational programs in our elementary and secondary schools and for the public generally as well as for special interest groups. "Environment" and "ecology" are today very popular words; those who can discuss them with apparent knowledge are on the side of the angels. These words are not always fully understood by the experts and even the experts can't always agree on the best course for "environmental" or "ecological" protection. We as a people face difficult decisions. Some choices may well require restraint in our affluent way of life. We may have to forego some luxuries. How well prepared are we as a people to make the hard choices if the "best" choice means a lower standard of living or a higher cost? Since both the costs and the consequences fall ultimately on the people, we will need most of all an enlightened citizenry.

I have a great deal of faith in the ordinary citizen of this country to control his own destiny. Despite the fears of big government and big business and outward chaos that sometimes surround and seem to engulf us, I believe the people of this country still can decide the issues which affect the course of their lives provided they are given adequate facts upon which to base a judgment. I'm willing to abide by those decisions after the facts are available.

Often, however, government fails to provide the facts it has, or distorts those facts to its own ends, or refuses to help discover other facts that should be available to the citizen's decision making. I do not believe that a governmental agency can better decide for people than people can decide for themselves how it is they should live. I do believe government has a responsibility to make its expertise available to its citizens or foster the development of the expertise it feels is needed for its citizens to meet the challenges they face. Our children, more than we, will be affected by what we do to the environment. They will need knowledge we did not and do not possess. To begin now to accelerate the development of that knowledge is none too soon.

All of us can bemoan the poor quality of our environment. We can change it only as the public generally understands the issues and supports the chosen solutions.

Mr. Moore. The major problem that I have seen in terms of concern for environment is that the specialists that operate in this field today are prepared primarily in higher education institutions where their education was compartmentalized.

It is somewhat difficult to get in the Federal agencies, to get those trained in one specialty to fully appreciate the competence of those trained in other specialties.

In supervising professionally trained employees one of the problems is to be able to see the whole problem rather than the problem constructed from its individual parts.

Quite often a problem constructed from its individual parts is not an accurate reflection of what the true situation is.

This is not to say that the educational system is lacking in the way it has been structured. We structure things to our needs.

I just think the circumstances are changed. We need to structure an educational program that's different from the ones that have trained those who operate in these fields.

Here again in legislation such as you have proposed in this bill, my major concern is that the support go to truly innovative or new types of environmental education, particularly at the college and university level.

My theory is that with the public emphasis upon the environment and ecology that higher educational institutions will merely change the names of things and go on doing the same type of preparation that they have gone in the past.

Mr. Scheuer. Give me an example of that.

Mr. Moore. A department that has been called the department of sanitary engineering suddenly shows up in the catalog as a department of environmental studies.

Mr. Scheuer. I was in Harvard business school at the start of the war and they were training officers and supply officers and they took courses in marketing and they included it in this defense course and they changed it from marketing, I think, changed it to the distribution and allocation of civilian industrial products.

Mr. Moore. Exactly the same.

Mr. Scheuer. A change in label.

Mr. Moore. The other thing that may happen in this field is that, rather than creating truly multi-disciplinary departments, there is a tendency to create an interdepartmental arrangement whereby you umbrella the existing departments with a department called environmental science, or something, and if there is funding available the funding comes into the newly named or merely shell of an organization and each section takes its share and goes back to its own specialized department and continues doing what it has been doing or pursuing something else in which it has an interest.

I would hope that in the development and implementation of legislation like this, the institutions who are really attempting to create new environmental departments will be the ones to get the support because I think we need a new concept in terms of what it is we are trying to achieve.

Mr. Scheuer. Don't you think also, in addition to new environmental departments, that the environmental implications of public actions and private actions ought to be woven into existing departmentalized teaching?

In other words, when we teach American history, shouldn't we weave into that what happened to the American environment, particularly with the advent of the railroad, transcontinental railroad?

Mr. Moore. Right. Transportation.

Mr. Scheuer. Development of highways, development of suburbia, development of atomic power, the tremendous increase of consumption that's just taken place in the last 15 or 20 years the fantastic increase in solid waste that's taken place as the result of the development of plastics and other new materials, the impact on our environment of the technology that produces non-biodegradable products such as aluminum and plastics, shouldn't that be woven in our courses in history, sociology, urban planning?

Mr. Moore. Certainly it should be gotten into the course content of the various subjects.

Fundamentally you will not get a change in environment, I contend—since it is the background of my own specialty—I contend we will not get a change in the environment unless we get a change in the political arena in terms of political leaders being able to sell the concepts of their colleagues in the necessary disciplines and sciences.

If you had people chosen from the various specialties, as I would conceive of an environmental department then you would have a vehicle to offer the engineer who is going to specialize in some field of engineering, something in the field of environmental science.

If you go the other way, he could take a course that may have some environmental interest and he would have a smattering of the problem, depending on the professor he has. He might get an exposure to the environment as it relates this course, but he would not have an array of disciplines addressed to the environmental problem.

It is entirely possible that this will have to be developed over a period of time and cannot be created now.

For example, something I call that "near-shore estuarial environment" where rivers empty into the sea is in my opinion vital to our ocean food chains.

We have concentrated on oceanography where waters are deep because this is more attractive, the deeper you go the more attraction there is to study there, when in reality an understanding the estuarial areas in the country may be considerably more important to man's impact upon the oceans than any study you might conduct in the deep oceans.

We have tended to concentrate on the inland waters and lakes again, rather than the estuaries, and there is a tendency—because of the emphasis on pollution—there is a tendency to try to move pollution where it has least visibility so there is a tendency to move the pollution down the river as far as possible and ultimately into the estuary and ocean.

Here is an area I think has been overlooked.

With regard to the higher educational institutions, my primary concern is that there be developed new concepts as to how they should put together a department that concentrates in this area, bringing in the lawyers, the engineers, the sociologists, the population experts about which there is a great deal of discussion now, the economists and financial people. Here again we get into another area.

One of the things that concerns me about financing and cost and economics is that we have a tendency to want to reduce things to pluses and minuses and add up the columns and determine it comes out plus or minus.

Cost-benefit analyses can only measure things that are capable of being measured, and there are some things in the environmental field that can't be measured in the traditional sense.

Mr. SCHEUER. Can you give us a list of things that can't be measured?

Mr. MOORE. All right. What value is a water course just for the people who walk beside it but don't water ski or swim? They don't want it to smell bad. It could be severely polluted but it might not be obvious to those walking along the bank.

There has to be an understanding of things other than those that can be measured or added up or subtracted in terms of arriving at a cost-benefit analysis.

And really all of us should have the right to pay more than the cost might be, if we want something more than the cost, that is to say, cost should not necessarily be the determining factor when it comes to environmental considerations.

It we want to pay more and get a better environment, I think we should pay more—be allowed to pay more—and get a better environment than a cold arithmetical calculation might justify.

And I think one of the areas in which we have been unable to fully advise the people in this country is in the area of what the costs are. I don't think the average citizen has any grasp of the relative costs of different qualities as they might affect him and the way he lives and his way of life.

I think there is a contribution that can be made by those who know something about costs and finances and so on.

But I think the choice must ultimately lie with the ordinary citizen who lives in his environment, and for him to make the choice I think he needs to be informed.

I do not believe that government should make the choices for him but I do think government has the responsibility to do all it can to see that it has the ability to maintain a basis so he can do that.

One of the hopeful things for the long-range environment is the provisions contained in the bill for primary and secondary students.

For example we had a project at the Federal Water Pollution Control Administration to get into the student newsletter given to second, third, fourth, and fifth graders—a weekly newsletter that deals with current events. We spent a great deal of time designing an issue that would deal with the question of water pollution control. This was distributed to all the schoolchildren throughout the United States at a particular grade level.

Then we got interested in the question, if you can do it for a given grade level, that is, if we are going to get this into the public school system, why don't we design one for different levels so that you can every year have an updating on a regular basis of the special issue of the newsletter going out explaining what water pollution does to the student?

In the long run this is where we will have to make the impact because, you see, I also happen to be convinced that we will have to either pay for adequate control or deprive ourselves of some of the benefits of the technology and production we now have. The real test will come when we make those choices that cause us to have a less affluent standard of living.

Mr. SCHEUER. The question I would like to ask you as a sophisticated financial man——

Mr. MOORE. Not that sophisticated, in a year.

Mr. SCHEUER. Well, we will see—is: Couldn't we provide our decisionmakers with more sophisticated measures on which to make those choices?

You talked about cost benefit before. We build a large-scale housing project. We build a road program. We build a dam. We build an atomic energy installation. We build a utility on the East River.

We know that each one of these things are going to have environmental fallout—expression—the most of which can be expressed in dollar terms, some of which can't.

Do you envisage that we can build an econometric model of a region or perhaps of a major portion of the country or of a country or of the entire Nation itself or conceivably the planet, whereby if they decide to build a steel mill or a smelter on a particular point in the Ruhr Valley and you put in the computer all the information about the kind of fuel, the hours, the volume, the seasons of the year, there would be a printout of that computer that would give you the environmental fallout from the whole Ruhr perhaps passing over half a dozen national boundaries, air pollution, water pollution, noise, and the works?

Or if a particular automobile is going to be produced, 350 horsepower, that we know a certain amount of pollution? Or a road program is contemplated, what is going to be the environmental fallout on the national community and the community where that plant is being located?

Could not a computer-computerized econometric model give us a far more sophisticated appraisal of the cost benefit we are gaining from this and the trade-offs we are making without knowing we are making, than our most sophisticated executives can make now, flying by the seat of their pants, which is the way they are flying on these decisions?

Mr. Moore. I think it is possible. With my remarks about cost benefiting, I did not mean to imply that you should not ultimately try to cost benefit the other environmental factors into the construction of physical facilities.

There was a time when we did not assign a value in the lakes for example—you were talking about the reservoir—we did not initially assign a benefit to the recreation aspects.

That's included now. We are analyzing, and attempting to develop the sophistication to analyze the benefit that arises from the recreation use of a reservoir.

There is a technology being developed for assigning values to benefits that were not heretofore considered, and the question is: Have we given too much emphasis to a given value, as opposed to another value?

I think it is possible to cost-benefit some environmental questions so long as you understand the first time you do it you will leave something out.

The danger with cost-benefit analysis is that people who use it decide that it is perfect, and it tends to become fixed in their minds as the yardstick they use when they measure values.

Mr. Scheuer. Look. At best it can be a rule of thumb, more of a rule of thumb, than the half-baked measures we use now.

Mr. Moore. And in terms of the econometric model you describe, there is probably not adequate hardware to get a given result but that's no reason not to try to develop the software, because by the time you take the bugs out of the software the hardware will be perfected.

For most regions of the country there ought to be an econometric model.

One of the reasons is the things you were talking about with regard to electric power. If we are serious about doing something about the environment, we have to accept the fact that some areas of the country should develop differently from other areas of the country.

The whole country cannot be equally developed.

Mr. Scheuer. What is the maximum population development of Arizona? The two Udall brothers would like to see 80 percent of the population settled down there. They were pushing for an atomic energy installation on the Colorado River that would produce enough power and water to support a population in the Arizona region that, if you looked at it from the point of view of the entire national interest and what a balanced population growth would be in that area, it just wouldn't make sense at all.

Mr. Moore. You come to a consideration we are not yet sophisticated enough to accept, and that is the entire State may someday have to try to determine what population it should support and then not admit any more population.

Mr. Scheuer. That's right. What is its maximal population in order to enhance everybody's bundle of satisfaction, and that's when you are going to run into zero PG, zero population growth in this country.

Mr. Moore. Yes. And the only way we can come to it is to teach it gradually. You cannot get there today.

The prevailing concept for my generation is you have to develop 100 percent of everything.

Mr. Scheuer. More goods, more services, more cars, works.

Mr. Moore. And this is one of the reasons we have pollution problems, because we sometimes have the concentration in the wrong places.

Mr. Scheuer. I am going to ask you one more question. You are in the field of municipal finances.

Mr. Moore. Yes.

Mr. Scheuer. Is your securities house a rating agency? Do you rate cities?

Mr. Moore. No, sir, we do not rate.

Mr. Scheuer. You invest?

Mr. Moore. Yes.

Mr. Scheuer. You buy securities?

Mr. Moore. Yes.

Mr. Scheuer. Let me ask this. What are the rating agencies that you depend on?

Do you depend on Dun & Bradstreet?

Mr. Moore. Standard & Poor, Moody's and Dun & Bradstreet.

Mr. Scheuer. All right. Could you see the possibility that in some future time in rating the municipal bonds of Grand Island, Nebr., or Little Rock, Ark., or New York that Dun & Bradstreet and Moody's and Standard & Poor's would include in their rating in putting, evaluating, appraising the credit of a city, that they would include in their appraisal of the bonds or long term debt of that city not only how the city is running its short, middle and long term debt management, but also how it is managing its environmental problem?

Because when you are thinking of long run or middle run, you are thinking over a term of years.

And how it is handling its waste disposal and pickup and garbage disposal and abandoned car disposal?

It is clearly going to affect the kind of people that live there, the tax base and the residential plan and the business that's going to feed off the residential plan.

Could you see a connection between how the city is treating its problems of air pollution, water pollution, garbage disposal, with the way you rate its bond tomorrow?

Mr. Moore. I must say that's the first time I have heard that idea, Congressman, so my reaction will be sort of off the top of my head.

Let me say this. The reason I am concerned——

Mr. Scheuer. The reason I say this is because all these things might affect the soundness of its long term tax base, both business and residential.

Mr. Moore. The reason I say that, at Eastman Dillon the section in which I work is attempting to develop and finance joint municipal-industrial waste collection and treatment facilities on a regional basis.

I can see a time arriving for what you mention, but I think it will have to be by stages. I can see a time when for a peripheral city the bonding house would say, "Look, there's no real justification for you to take this debt on as a peripheral city.

"This project should be part of a major metropolitan area."

I suspect you might come to this over time in that manner.

One of the things that is of concern—and I would prefer not to name cities, but one of the things that is of concern obviously is the present condition of some cities by virtue of their past history of having failed to take care of environmental considerations.

Mr. **Scheuer**. This is exactly the point I am trying to make.

Mr. **Moore**. Yes, and by virtue of their failure to take care of environmental conditions in the past, they now find themselves in difficulty financially because they do not have the economic or property base upon which to support their needs.

Mr. **Scheuer**. If you would name a few cities you would make the front page of the *News* and the *Times* tomorrow morning.

Mr. **Moore**. I have seen what happens to those who name cities.

Mr. **Scheuer**. I know; but this is precisely the point I am making. Just as you could name cities that cannot meet their environmental problems today because of what they did or didn't do 10 years ago, couldn't you see an effect on the tax rating structures of these cities by what they are doing today because of the way they treat their environment? What will happen? Because this will affect their ability to pay.

Mr. **Moore**. Yes. Some would say they can look at the performance of a city in the environmental arena, and judge how the city is living up to its obligations in other activities. Are they looking at the cheapest way they can get by in relation to economic development? I believe business is looking in the other direction in the country because I think people are convinced what they do with the environment locally will have an impact on their image to outsiders.

Mr. **Scheuer**. On their ability to attract top flight executives.

Mr. **Moore**. Yes. The type of people they want to attract will not look at the wrong kind of environment, so they are looking at the political subdivisions to see whether or not they are keeping up with their environmental responsibilities.

Here again this requires an educational process developed over a period of time, so there is education and acceptance for what you are trying to do for the environment.

I have enjoyed being here.

Mr. **Scheuer**. I can't thank you enough for your testimony. It's been very, very stimulating. Very grateful to you.

Mr. **Moore**. Thank you.

Mr. **Scheuer**. The subcommittee stands adjourned.

(Whereupon, at 2:45 p.m., the subcommittee adjourned.)

ENVIRONMENTAL QUALITY EDUCATION ACT

FRIDAY, MAY 1, 1970

House of Representatives,
Select Subcommittee on Education of the
Committee on Education and Labor,
San Francisco, Calif.

The subcommittee met pursuant to notice at the Morrison Auditorium, California Academy of Sciences, Golden Gate Park, San Francisco, Calif., Hon. John Brademas presiding.

Present: Representatives Brademas, Reid, and Hansen.

Staff members present: Jack G. Duncan, counsel; Maureen Orth, special consultant, and Marty L. LaVor, minority legislative coordinator.

Mr. Brademas. The Select Subcommittee on Education and Labor of the House of Representatives will come to order for the purpose of further consideration of H.R. 14753 of the Environmental Quality Education Act.

The chairman wants to express on behalf of himself and his colleagues how very pleased we are to be in the State of California and in this particular location.

The purpose of our hearings today is to give further consideration to legislation that has been introduced in the House of Representatives by the gentleman from New York, Congressman Ogden Reid, who is with us here today, and the gentleman from Idaho, Congressman Orval Hansen, who is here as well, by Congressman James Scheuer of New York and by myself.

The purpose of the Environmental Quality Education Act is to provide Federal support for a variety of activities which, the sponsors of this legislation feel, will help meet the environmental crisis to which so much attention is now being given in our country.

The bill authorizes funds for a variety of purposes, for developing materials, for teaching environmental studies, for the training of teachers to offer such courses, for the support of environmental studies, courses in elementary and secondary schools, for the support of environmental studies offered in community conferences, workshops, adult education courses which might participate, civic and industrial leaders, State and governmental officials and others.

Finally, the bill would authorize funds for the preparation of materials on the environment for use by the mass media.

San Francisco is one of the loveliest cities in the United States—indeed of the world—but as people who are with us here today will understand better than will those of us who do not live in this area, San Francisco shares with other great cities the same problems of dirty air, polluted water, overcrowding which are daily examples of our continuing failure to develop intelligent environmental policies.

The members of this subcommittee are for strong support of legislation in Congress to help combat pollution and protect the quality of our environment, but it is the conviction of the sponsors of this legislation that we need, over the long haul, if we are to have intelligent environment policy in the United States, to have a citizenry that is both informed and educated about the whole spectrum of issues that we have come to describe as ecological or environmental.

This, therefore, is the legislation that brings us to California. We are particularly pleased to have as our first witness today a distinguished Member of the House of Representatives who is highly regarded in the Congress of the United States and who we are aware has a deep interest in the subject matter of this legislation.

He represents the Seventh District of California and is our first witness this morning. We are pleased to hear from Congressman Jeffery Cohelan.

STATEMENT OF HON. JEFFERY COHELAN, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF CALIFORNIA

Mr. COHELAN. Thank you, Mr. Chairman, and members of the committee.

I would like to take this opportunity to welcome you all to California. It is a great pleasure to be here today on this beautiful day in this great Golden Gate Park to testify on behalf of the Environmental Quality Education Act.

I appreciate the opportunity of coming before the committee and thank the distinguished members of the committee for affording me this opportunity.

As you know, I have long been concerned about this critical problem of environmental pollution and I am pleased that the committee saw fit to come out here to the bay area to hold hearings on this issue. We residents of the bay area know all too well the seriousness of the situation.

I want to commend my colleague and good friend, Congressman Brademas, chairman of this subcommittee, for his superb efforts in putting together a bill of such substance and quality—along with his colleagues—a bill which reflects the critical nature of the total environmental pollution problem and which also espouses sensible and realistic approaches to deal with the problem.

Now, as I understand it, this bill would authorize funds for the development of materials and aids for teaching environmental studies; for teacher-training programs; for the development of new curricula in environmental quality and ecology studies for elementary and secondary schools; and for establishing programs and workshops on environmental pollution for business, civic, political and government officials, as well as for private and public organizations.

This measure is praiseworthy in its attempt to deal with this situation. It is a significant step towards change and is noteworthy for its far-reaching possibilities and its impact.

However, I would suggest going even one step further, and that is to specifically emphasize required curricula for all students in environmental education courses. In the appropriate section of the bill, I would therefore recommend that a direct incentive program be established for schools that would make environmental studies a required part of their curricula.

To me such study encompasses both the arts and the sciences and could easily be fitted into these specific programs of study. The crux of the environmental problem is indeed a lack of awareness of the total situation and an inability to understand the total consequences, and an inability to deal constructively with the situation.

Our children must be educated on this issue and this can best be done within the structure of the classroom and through a programed curricula. I personally see an incentive program for school districts to encourage this addition to their curriculums as a workable and feasible suggestion, and respectfully submit it for the consideration of the committee.

This is a crisis of the greatest magnitude. Though the attack has begun on all fronts, citizen concern, student activation, mass communication media and congressional action, education is but one—yet the primary battleground.

To effectively carry on the struggle against our own destructive instincts, we must reorient our thinking and reeducate our people to the problem. It is only in this way that the next generation will not continue to destroy our environment, but rather will preserve it.

We cannot allow our recognition of the problem to diminish because beginning measures have been taken. The preservation of our environment—and I may say the preservation of man himself—demands lifetime attention. We are not only living under the cloud of possible nuclear destruction, we are also living under the cloud of destruction by our own technology, by our own waste.

It is the ultimate perversion that we have allowed the benefits of our industrial society to turn against us and to become our greatest nuisance, and possibly our greatest threat.

I further recommend that the committee give serious attention to the incorporation of a section in this bill providing for a Commission of Ecological Studies, to be put under the direction of the Office of Education.

This Commission should be directed to develop an environmental education curricula for all public school grades. This curricula would then be made available to all State boards of education for use in planning their own State-controlled curricula. The Commission would draw on the best available talents and would serve as a continuing resource bank for environmental studies.

In submitting these suggestions for the committee's consideration, I repeat my previous comments on the value of this measure.

This bill is one deserving of special attention and credit. It is a comprehensive and positive attack of the problem. It goes beyond the strictly pollution cleanup program solution type of legislation in that it is directed to the heart of the problem, that of changing—through education—basic attitudes of the American people toward its environment.

I have not had this in my script, but it is essential, Mr. Chairman, it is a matter of moral philosophy.

Mr. Chairman, in closing, I would like to bring to the attention of the committee an article entitled—and I quote—"Lack of Reverence for Nature."

This article is an interesting analysis of this problem of environmental pollution and has relevance in terms of the issue we are discussing here today.

Just allow me to quote from the article—and I quote:

> The one thing needed to recover and preserve the American environment is exactly the one thing, money, programs, and Presidents cannot instantly effect among the people: A reverence for the earth.

Implicit in this statement is the need for changing attitudes, for education and reeducation.

Mr. Chairman, I would like to request that the body of this article be attached to my statement and included in the record of this hearing.

And, again, I want to thank you very much for this opportunity to give this testimony this morning.

(The article requested follows:)

[Reprint from the Washington Post]

THE LACK OF REVERENCE FOR NATURE

(By Coleman McCarthy)

Politicians and businessmen, often the last to prevent a disaster but the first to squirm when it comes, are predictably raising their voices and their dollars on the crisis of pollution control. That many use the word "control" is itself a hearty mock of nature, as if nothing is wrong with polluting the air, land and water, so long as we control it. Hardly a syllable is uttered about elimination, perhaps in stiff fear that if America eliminates pollution who knows what else might go—perhaps the happy twosome of progress and profits.

Thomas Merton, the late Trappist priest who spent 25 years in the Kentucky hills seeking union with God and harmony with Nature, wrote shortly before his death a moving essay on the environment called "The Wild Places." Merton believed that the "tragedy revealed in the ecological shambles created by business and war is a tragedy of ambivalance, agrression and fear cloaked in virtuous ideas and justified by pseudo-Christian cliches . . . An examination of our social, economic and political history in the last hundred years would be a moral nightmare, redeemed only by a few gestures of good will on the part of those who obscurely realize that there is a problem. Yet compared to the magnitude of the problem, their efforts are at best pitiful; and what is more, the same gestures are made with great earnestness by the very people who continue to ravage, destroy and pollute the country. They honor the wilderness myth while they proceed to destroy nature."

In peeling the pollution onion to its eye, it is not really enough that we are going to spend billions on anti-pollution programs, or that polluters are being hauled into court, or that Mr. Nixon is sponsoring road shows to express his alarm. The one thing needed to recover and preserve the American environment is exactly the one thing money, programs, and Presidents cannot instantly effect among the people: a reverence for the earth. This reverence, in its simplest form, means paying fair homage to the soil, the winds, the waters and honoring the very spirit of their places. In the balance of ecology, wrote American naturalist Aldo Leopold, "A thing is right when it tends to preserve the integrity, stability and beauty of the biotic community. It is wrong when it tends otherwise."

One reason the American environment is now a septic tank is that we have never considered ourselves in union with the biotic community. Arrogantly, we have chosen not to be a partner but a master, always goaded to greater horrors by one ethic; what good is Nature if it can't be transformed into wealth? Many believe that our ecologic depravity comes from the Bible—an over-emphasis of the notion in the first chapter of Genesis that man was meant by God to have dominion over all living things. When the Puritans, with their love of literality, came to the North American continent, they took it as their Christian duty to fight and tame the wilderness. That was "God's work." The Bible and ax-carrying pioneers followed, and the nation needed only 200 years combat duty with Nature to subdue it with asphalt, chemicals and atmospheric mud.

Part of the taming of the wilderness was a legitimate struggle for existence; the trouble came when the early American tiller of the soil and feller of trees saw nothing wrong with taking a little extra food from Nature; just to make the next struggle easier. This was labelled progress, and if anyone argued, he could be refuted by Genesis I and the growing GNP: the Almighty God and almighty dollar.

Since the time when the first trees were needlessly cut by an early American settler, the overkill mentality has prevailed. It became a habit of mind, a destructive urge so deeply subconscious that even now the politicians and businessmen are easily conning the public that the environment can be saved with just money, programs and patience. Few dare say that pollution is in our national blood, a part of our mood and a basic to our economy, and until we get it out of all three—completely out—our country is doomed. Doomism is not popular among a people who have convinced themselves they can do anything; but eventually the unrevered earth will begin returning to us exactly what we have been giving to it: cruelty and poison.

Assuming for a moment, a wild one, that this country could miraculously *regain its senses, what would reverence for the earth involve?* A recent talk by Dr. Rene Dubos at the Smithsonian Institution supplies an important part of the answer. Insisting that Nature can be used, without being exploited, by means of "creative intervention," Dubos cited practices of the 12th century brothers and priests of the Cistercian order. With only their muscles and reverence for their land, they used ecological concepts which are as relevant to modern times as the latest ideas of a Fuller or a Doxiades.

"The Cistercians," said Dubos, established their monasteries in the lowlands and swamps; consequently, they had to learn to drain the land, and therefore they learned to use water power. And, through these technological practices, they converted areas of swamps and forests—that were not habitable because of the prevalence of malaria—into wonderful fertile land which now makes up much of Europe's countryside.

"The achievements of the Cistercians serves to illustrate another aspect of modern ecologic philosophy . . . the swamps in which they established their monasteries were built for human life because of insects and malaria. But monastic labor, skill and intelligence converted these dismal swamps into productive agricultural areas, many of which have become centers for civilization. They demonstrate that transforming of the land, when intelligently carried out, is not destructive but, instead can be a creative art."

As an example of modern creative intervention—there are a few, incredibly—Dubos praised the stretch of the Taconic State Parkway above New York City. "This is a product of technology which has transformed nature while still respecting her character. I think the Taconic Parkway is a kind of creation which in some ways is the equivalent of the medieval cathedrals."

Another important statement on reverence for the earth is the book, "Design With Nature," by Ian McHarg (Natural History Press, Garden City, New York), McHarg, a landscape architect, goes beyond melancholy and dismay over the antinature crimes.

In great, but readable, detail, McHarg outlines ecological plans for the Potomac River Basin, the Green Spring and Worthington Valleys above Baltimore, Staten Island, the New Jersey shore and the Philadelphia airshed.

Man is only a recent visitor to the planet earth. Compared to the billions of years that the primordial forces worked in silence in the vast canyons of cosmic space, he has been here only an infinitestimal moment. The prospect that he will pollute his species back to oblivion is a huge tragedy, but perhaps it is only part of a cycle, a ripple in the contour of evolution, part of the pilgrimage of living things that began with cells and plants and only lately has included man.

The philosopher Whitehead saw the earth as a "second-rate planet revolving around a second-rate sun." Despite this, the earth has been a gracious host for the few moments its most recent visitor—man—has been here. But has never guaranteed this species a permanent place; and because man is doing what no

other species has ever done—quarreling with Nature—it appears that his presence on earth will be nothing more than a brief guest appearance.

Mr. BRADEMAS. Thank you very much, Mr. Cohelan. I just have one question following a very useful statement.

You are a member of one of the most powerful committees of the House of Representatives, the Committee on Appropriations, and I wonder if you could give us any comment from that experience about the attitude in the House toward legislation that would provide additional funds for pollution control, pollution control programs generally in the United States.

We are here talking about a bill to change attitudes toward the environment. Do you have any comment on whether or not there has been a change within the House in attitudes toward measures that would help us fight pollution?

Mr. COHELAN. Well, yes, Mr. Chairman. As you know, as you so well know, in the last session of Congress we had a program in the House of Representatives which was known as full funding for water pollution, a billion dollar program. Many Members—including those present—were participants in that.

When the matter came before the Appropriations Committee, there was recommended only $200 million in the budget estimates for 1970. The Subcommittee on Interior Appropriations reported to the general Committee on Appropriations a bill of $400 million.

In the committee as a whole we had a very, very hot argument and we finally reached agreement that we would bring to the floor a $600 million bill.

As you know, in the process of conference with the Senate, we came out with a compromise measure in the 1970 budget of $800 million, which incidentally the President of the United States agreed to and so we are moving in the right direction.

In the authorization legislation, may I caution you, there are still some remaining difficulties. There is an effort to keep the great State of New York and the great State or California from getting all the money. About 74 percent of the problems of pollution and sewage control in this country are associated with these great States. There are limitations in the authorization bill which must be removed.

Even to this date today, to this moment, the Public Works people are unable to fund projects because the communities have not developed matching funds and have not met the requirements of the legislation.

Therefore, Mr. Chairman, I would urge that your committee and others in your report make some reference to this defect which would seem to me to be in the authorization bill.

Mr. BRADEMAS. Thank you very much. Mr. Reid.

Mr. REID. Thank you very much, Mr. Chairman, and I would like to thank my colleague, Mr. Cohelan. I would also like to thank you for your statement, for your suggestions on curriculums on ecology and the environment, and for your suggestion that we really need an ethic which represents a deference to life and nature. Permit me to ask you two questions:

One, in relation to the preparations in the great State of California, I think it is roughly estimated that the water plan in that State costs about $1 billion. To do an equal job on air or on pesticides and to bring together the various disciplines so that we stop disturbing the ecological balance, substantial sums of money would be required.

You have been one of the leaders in the fight to get an increase in the water pollution funds but we all know that even that amount was relatively a drop in the bucket.

Do you see any fundamental change in our national priorities, a willingness to have funds spent on domestic needs, including the environment?

My second question is, would you briefly comment on the state of the environment in California and the the steps taken here and in the schools?

Mr. Cohelan. Thank you, Mr. Reid. As you know, the issue that you pose in terms of the balancing of our national priorities is a fundamental question that is facing us in the seventies.

With you and your colleagues of like mind, I know that we feel there are very important and substantial changes that must be made in the budget.

I would refer, for the benefit of the record, to the recent paper written by the distinguished Charles Schultz and a number of associates at the Brookings Institution calling for the selection of national priorities. He shows that with the $200.8 billion we have in our current 1971 budget, we have about $180 billion, plus or minus, uncontrollable items. There is only left in the budget of $200 billion, $20 billion for schools, education, and all the rest and this is obviously not enough.

Now, what are the others? Defense is $72 billion; interest on the public debt is $19 billion; Commodity Credit Corporation, Agriculture, Veterans' Administration, social security and medicare which are virtually open-ended items, and when you sum this up you come to $180 billion plus or minus.

Now, we clearly have to reorganize our priorities to get more on the other end of the scale and, obviously, it is clear that unless we want to have substantial tax increases in our country in the balancing of our economy, we are going to have to cut in some of these areas and the most vulnerable area has to be defense. [Applause.]

Mr. Reid. Would the Appropriations Committee at least entertain doubling what we are now spending?

Mr. Cohelan. Pardon me?

Mr. Reid. I will just repeat that. Would the Appropriations Committee at least entertain doubling what we are now spending?

Mr. Cohelan. The Appropriations Committee, as the gentleman well knows, is a very parsimonious committee. We have some of the most prudent members—well, that's not a fair statement.

Mr. Brademas. Imprudent?

Mr. Cohelan. I really meant parsimonious members of our colleagues happen to be on that committee and unfortunately—and I think this has got to be said—that many of our colleagues come from rural areas in the United States. Many of our colleagues on our Appropriations Committee come from the southeastern region of the United States and they simply don't understand the problems of the great West and the problems of the cities.

The West has always been environmental conscious in reclamation, water and all the rest. Now, I have forgotten the second part of your question.

Mr. Reid. Just a brief comment on what is being done in California in the schools on environment and anything on the environment generally.

Mr. Cohelan. Well, I am quite proud of our State. We have been in the vanguard particularly with conservation organizations. I think the Sierra Club and many of the allied conservation organizations have been very active in this area.

Mr. Reid. I agree.

Mr. Cohelan. We were able with great help from so many people in our State on a bipartisan basis to get the Redwood National Park, which is a great achievement, and recently the Point Reyes National Seashore, which has been fully funded.

Mr. Reid. Thank you.

Mr. Brademas. Mr. Hansen.

Mr. Hansen. Thank you, Mr. Chairman.

May I also express my sincere appreciation for the opportunity that you helped provide for us to spend the day on this bill in the bay area.

We also acknowledge a very effective leadership which you have given, not only to the effort in the subject matter of this bill, but also in the area of education that we on the Education and Labor Committee know well.

I am grateful for your constructive suggestions and emphasis on environmental studies in the schools, to consider some incentives that may lead to an adoption of some required courses.

Let me ask, in addition to identifying specific courses that we call environmental studies, would you also agree with the suggestion made by some of the witnesses in these hearings that the need is to reexamine all of our courses?

Mr. Cohelan. All of our what?

Mr. Hansen. All of our courses of studies in our schools——

Mr. Cohelan. Oh, yes.

Mr. Hansen. To determine what environmental components should be incorporated in order to emphasize the multidisciplinary nature?

Mr. Cohelan. Yes.

Mr. Hansen. Of this course?

Mr. Cohelan. Of course I agree completely. It is a whole problem literally and it penetrates all of the disciplines. There are others here who will testify along this line. There is one great man who is in the audience who raised the rhetorical question, "What kind of landscape do you want?" And this is a moral and philosophical question.

I read an article here in the Christian Science Monitor which raised a very important question relating to your bill.

A very distinguished ecologist indicated that one of the problems with all of this thrust that now is being made in the field and in the interest that is shown in the subject of ecology is that we don't have enough teachers in ecology.

One of the functions and purposes of your bill I would hope would be to create teachers of ecology. He made the very point that you are making, Mr. Hansen.

He said that it includes mathematics and it includes the other disciplines and it should permeate the total curriculums. It should be a holistic approach.

Mr. HANSEN. Thank you very much.

Mr. BRADEMAS. Mr. Cohelan, we are very grateful to you for your opening statement and that you could come. The Chair would like to invite you to join us in questioning the subsequent witnesses.

Mr. COHELAN. Thank you, Mr. Chairman.

Mr. BRADEMAS. The Chair would also like to express its gratitude and the gratitude of the subcommittee to all officials of the California Academy of Sciences for having made it possible for us to meet at Golden Gate Park.

For the benefit of those who come to sit in on these hearings, the Chair would like to say that we plan to conduct these hearings until about 1 o'clock, then break for lunch and then we will resume in the afternoon. We shall begin at about 2:30 with a panel of students and faculty from universities and schools in the Bay Area.

Our next witness is Dr. Kenneth Boulding.

Dr. Boulding is professor of economics and director of the Institute of Behavioral Sciences at the University of Colorado. He is as well the president of the Peace Research Society of the Association for the Study of the Economy, and in 1968 was president of the American Economic Association.

Members of this subcommittee are familiar with Dr. Boulding and with the many contributions that he has made from his vantage point as a distinguished economist in the consideration of some of the important social and public issues that face our country and we are particularly pleased, Dr. Boulding, to welcome you to our subcommittee this morning.

Go right ahead, sir.

STATEMENT OF DR. KENNETH E. BOULDING, INSTITUTE OF BEHAVIORAL SCIENCES, UNIVERSITY OF COLORADO

Dr. BOULDING. Thank you very much, Mr. Chairman. I appreciate this opportunity very much to testify to this distinguished subcommittee. I should say and I should represent that this year represents my 21st birthday as an American.

Mr. BRADEMAS. Happy birthday.

Dr. BOULDING. The ecological crisis which is reflected in the intense activity around "Earth Week" in April 1970, is perhaps more a reflection of a change in man's awareness of himself and his environment than of any immediate change in the environment itself. It is significant that the intense interest in the environment this year has been generated not by any dramatic ecological crisis, such as the dust bowl and the dust storms of 1934, which produced the Soil Conservation Service, but rather by a sudden increase in awareness on the part of considerable numbers of concerned people, about the dangers of the course the human race is taking and the possibility of ecological disasters in the future.

The threat to the environment is created by the fact that virtually all human activity produces both goods and bads—that is, negative goods—in processes of joint production.

Hence, unless there are elements in the structure and organization of society to correct these processes, the increased production of goods, which is what we mean by economic development, almost inevitably produces likewise an increased production of bads.

If we want to increase agricultural productivity, we have to put artificial fertilizers on the soil, which runs off into the rivers and makes them—as ecologists say—eutrophic, that is good for algae but bad for humans.

If we want the freedom, mobility and social equality which is a product of the automobile—and I have to make the awful confession that I like driving my car—we are also going to produce a large amount of atmospheric pollution. If we want the possibly illusory sense of security which a large military establishment gives us, we must also face a positive probability of nuclear war and the almost irretrievabel ecological disaster which this would produce.

Even the present excitement about the environment has produced a certain amount of nonsense—academic nonsense—along with the wisdom which might be informative.

The intelligent response to these problems is to set up a social structure and organization which will encourage those forms of human activity and processes of production which produce more goods and less bads and which particularly produce those bads—if we have to produce them—which have a short length of life and so quickly disappear, for one of the nice things is that bads do depreciate.

This can be done in many ways, through the tax system, for instance, by taxing the production of bads, through such devices as effluent taxes and taxes on automobiles, graduated according to the amount of pollution they produce.

It can be done also by what we might call counter-organization, through the development of governmental research, through watchdog organizations which can detect and restrain pollution, and so on. You might call this the institutionalizing of Mr. Nader. [Laughter].

These structures and organizations, however, will not be created unless there is wide public awareness of the nature of the issues. This can be done most effectively through the educational system.

It is for this reason that I regard the present bill as a very important contribution to the long-run solution of these problems, problems of a gravity indeed which may even involve the whole question of human survival.

The danger of the kind of public excitement that Earth Week has produced is that it is temporary. People are aroused at the moment but soon revert into their ordinary patterns. Just as it is constant dropping that wears away the stone, so it is persistent education and organization which is the most effective means of long-run social change.

I believe this bill would create in our society an organization producing, as it were, a bias towards human survival and a better society. This may produce much more effect in the long-run than more dramatic but essentially temporary excitements.

This bill, if it is passed and funded, will provide a demand for environmental quality education. This demand may easily simply be inflationary, however, if there is not a potentially elastic supply. Not even Congress can buy things that are not on the market, and the wise Congressman will certainly look into this question before voting for the bill.

Fortunately one can have a good deal of optimism on this point. The environmental enthusiasm of this year has created an enormous interest in these problems in the whole academic community in this country. There are large numbers of people raring to go and who are held back only by the absence of an effective demand.

Furthermore, there are a number of organizations which are already in existence which are skilled in the kind of activities which this act would require and who could easily devote capacity and skills to this problem.

The social science education consortium—that I am associated with—for instance, has already done a great deal of work in the form of curriculum in the social sciences, and constitutes a fund of experience and skills which can easily be brought to bear on this problem.

Other organizations, such as the Joint Council on Economic Education, are excellently equipped to provide the services which the act is going to call for—and there are many others; I only mentioned the two that I am familiar with.

I have every confidence, therefore, that the act would produce a creative response in the academic community.

There is a dangerous tendency among some members even of the academic community to regard environmental problems as essentially insoluble and hopeless and hence to retreat into a kind of ecological eschatology, which preaches and bemoans and sits around to wait for the inevitable end.

This is not only nonsense but dangerous nonsense.

The history of the last great ecological crisis, that of the 1930's, which resulted in the Soil Conservation Act of 1936, shows that once people are aware of an ecological situation they do in fact do something about it.

Now, if you really wanted to see an ecological crisis you should have been in Chicago in 1934 as I was when the dust of Kansas and Nebraska piled up in the streets like snow. It was highly visible.

The soil of this continent is almost certainly in much better shape than it was in the 1930's, thanks to the creation of what is essentially an educational agency in the Soil Conservation Service. The kind of education that we need for the present ecological crisis is, of course, more diffuse and perhaps harder to organize than that needed for soil conservation.

Nevertheless, the historical experience points up that wise resource management is essentially an educational problem and the remarkable success of the Soil Conservation Service in achieving a technological transformation in American agriculture indicates that there are strong reasons to suppose that these problems—even the problems of today—are soluble.

The bill that is before this committee should receive widespread support from all those who are concerned with the problems of the environment. Nevertheless, it is perhaps not inappropriate to utter a certain word of warning, for with the best will in the world, the political process—like other processes of production—occasionally produces more bads than goods.

The experience with President Johnson's International Education Act has sensitized the academic community to acts of Congress which arouse great expectations and then are not funded.

The impact of the International Education Act indeed on education and research in the international system has been little short of disastrous. It aroused great expectations which were not fulfilled and these expectations furthermore led to a certain drying up of private sources of funds so that the end result is that the whole field of international systems research has suffered a severe setback precisely at the moment when it is one of the most necessary fields of research and education if we are to avoid the ecological disaster of war and the ultimate ecological disaster of nuclear war.

I would personally like to see a recognition in the present bill that the present international system is the most likely cause of ecological disaster for the human race and perhaps some provision which would make amends for the disastrous consequences of the previous International Education Act.

I would, of course, not wish to see the present bill jeopardized by any attempt to broaden it to the point where it could not succeed. Nevertheless, I would like to draw this matter to the attention of the Members of Congress.

Any serious attempt to provide education about the environment must also include education in those aspects of the social system which are most likely to create ecological and environmental disaster. If this bill can be given a broad interpretation it may do much to undo the harm which the International Education Act produced because of the unwillingness of Congress to fund it.

I feel that the experience with the International Education Act should be in the minds of the sponsors of the present bill, for if this bill also arouses great expectations which are not fulfilled and if it leads to the abandonment of this field by the private foundations and institutions, the end result could easily be negative. It would be most unfortunate if a bill which promises so much good should turn out to have these adverse consequences.

Mr. BRADEMAS. Thank you very much, Dr. Boulding, for a most provocative statement. I would just like to say one word about the International Education Act because, as you know, I was the sponsor of that bill in Congress and the chairman of the special task force which read the bill and I share with you a profound unhappiness that Congress has not appropriated a dime for the program since President Johnson signed it into law in October of 1966.

For the benefit of those who may not know what that bill is about, it authorized Federal support for international studies and research at the undergraduate and graduate level for colleges and universities here in the United States. It was not in that respect a foreign aid bill.

Mr. Reid and I were yesterday sitting in another subcommittee of this committee discussing title VI for a program of foreign language area centers which the administration had proposed be phased out.

But the President—and I was very glad to see this—decided this week that they would support with $15 million a year those programs which, as Professor Boulding suggested, are terribly important.

I would observe in light of the news of this week that there are but two title VI foreign language and area centers in this country supported by the National Defense Education Act for the study of Cambodia and there are 26 students in the United States giving themselves to a consideration of that area. That is just an aside.

I share the profound concern that Professor Boulding has expressed about this matter and hope that the same thing would not happen to our environmental education bill.

Let me ask you this question, Professor Boulding:

A couple of weeks ago a story appeared in the *New York Sunday Times* Magazine by Edmund Dale in which Mr. Dale—the economics reporter for the Times—said, commenting on the environmental issue that it was a false dichotomy to oppose technological process to the protection of the environment because, he said, whether we like it or not, we are going to have an increase in the GNP in this country, and I wonder if you could give us some comment from your vantage point as an economist on this whole question, on the relationship between an increased gross national product advancing technology and the problem of protecting the quality of our environment.

Is it necessary for us to choose one or the other? Would you expand a little bit on your bads versus goods analysis?

Dr. Boulding. Yes, thank you. I think the gross national product is a very inadequate measure of what you might call welfare aspects of economic activity and I think the National Income Statistics do need provisions to account for this environmental depreciation: that is, we deduct the depreciation of capital from the gross national product in order to get the net national product; but we ought to deduct more in the sense of what would be necessary to overcome these environmental deteriorations, in which case I think the economy wouldn't look as good as it does now.

But there is a misleading element in this, in the GNP itself, which I think is quite serious because, if the social and economic indexes are misleading , then it is very easy to base false policies on them.

I would strongly urge that we make the economists take another look at this and I am afraid that the profession hasn't been doing it.

Mr. Brademas. I would press my point a little further. I note that Senator Muskie, who as you know is a great champion of pollution control measures, said in New York that we could not, say, return to the view of "Let's go back to the plow," but that we ought to try and harness technology to help protect the environment.

Do you have any comment on that?

Dr. Boulding. I agree with the Senator; in other words, the problem is not stopping the increase of knowledge, for instance, or its practical application, but of directing this along the right lines—that is, it is a question of what technology and how we are going to direct our research, particularly our research and development activities, toward the discovery of those technologies which, as I suggested, have produced more goods and less bads.

I think we have to go on to further knowledge and even more technological knowledge, but we do have to count all the costs and this we haven't been ready to do, and this requirement requires better organization.

I think a merely moralistic attitude to pollution is bad. This is nonsense. That is, we don't have pollution because of wicked people, even of wicked corporations, but we have pollution because we want the goodies and so the baddies come along with it.

Mr. **Brademas**. Thank you very much.

Mr. Reid.

Mr. **Reid**. Thank you, Mr. Chairman, and thank you, Professor Boulding for your very thoughtful comments. What would you suggest specifically about taxing the bads, making corporations responsive to the environment?

Dr. **Boulding**. Well, yes. I think a great deal can be done through the tax system if we can identify the bads and value them. That's the difficulty, that they are hard to identify. I have been struck with this problem over the last 3 or 4 years, in the sense that when we come to things like the atmosphere—or particularly the study of the earth, of the total system—we really are involved here with an enormous area even in the natural sciences that we don't know much about.

Mr. **Reid**. On the other hand, the gross picture can easily be identified, specifically if you take lead out of gasoline?

Dr. **Boulding**. Right.

Mr. **Reid**. But when you get into nuclear powerplants which I prefer not to see built, when you get to power versus acceptable [applause] the question is how to effectively mandate that a corporation or powerplant must not be permitted to do anything that seriously harms the environment?

Dr. **Boulding**. Well, there are really two problems here:

One is the the problem of longevity of the bads versus the goods. This is the danger of radioactive pollution that stays around. If the pollutants would go away somewhere else, it would be all right—but they don't. If pollutants stay around in the earth, then the longer lasting ones are very dangerous indeed. I think there is a strong case for prohibitions. A prohibition is simply a tax, an extension of the tax system and, obviously, this is part of the armory of legislation.

All that we really are going to tax, however, is ourselves, and we have to pay the price for this. If this means doubling the cost of electric power, there are going to be squawks. There is a considerable assumption on the part of many people who are being naive, that we can clear up pollution without any cost to anybody. That isn't so.

The other problem is to be sure that the cost doesn't fall on the poor. There is a grave danger that the obvious solution of environmental problems is to allow the rich to go on polluting and prevent the poor from doing it?

Part of our very pressure on the environment today is a result of the fact that the mass of the people now can enjoy many of the things which were previously the privilege of a very small part of the population. We have to be very careful that we don't go back on something which is very dear to all our hearts.

The distributive aspect of environmental regulation always has to be taken into account. You can even argue that the results of the last two environmental crises had some adverse effects on the poor. The first under Teddy Roosevelt—and they come along about every 30 years, it seems—was the one that created the national forests and so on, may have had an adverse effect on the poor in the sense that it prevented them from moving into the Rocky Mountains the national parks and national forests had some effect in keeping poor people out of the mountains. Even soil conservation in the 1930's, as I appraise it, had some impact in driving the poor people out of agriculture. If now we try to solve the present problem by a tax on automobiles used to subsidize public transportation, the rich will continue driving the cars and the poor will have to ride the bus—which I won't like at all. I would much rather be rich.

But particularly we must trace these distributional effects.

Mr. Brademas. Mr. Cohelan.

Mr. Cohelan. I am wondering, to exploit your professional capacity, Dr. Boulding, if we could explore the possibility of developing a capital budget where we could put in or show some national depreciation; would this be a good first step to dramatize the arrangements?

Dr. Boulding. I would very much like to see an attempt at this. I think it is quite difficult in the sense of the great uncertanties, such as the impact of human knowledge which obviously has to be part of the capital budget; up to now, for the last 200 years, the increase in human knowledge has more than counteracted the using up of resources in the sense that we have created new resources through the advent of human knowledge, but this cannot go on forever.

Some dramatic assessment of the limitation of this, I think, would be very desirable at the moment.

Mr. Cohelan. One other question, Dr. Boulding. The Corps of Engineers has done a study that I think in the year 2020 this magnificent bay area—the land of my birth—there will be 20 million people.

Now, if this projection is true and on the basis of the present growth rate it appears to be true, it appears to be moving in that direction, what do we do about the energies to support this kind of population?

Dr. Boulding. Well, one way to present this is to create water shortages. In California didn't have such a beautiful water plan you wouldn't face all these environmental problems. Well, the one thing I learned about population projections is that they are all wrong—I think almost without exception—and I hope this one will not be true, either.

Mr. Cohelan. Well, I think whether it is 20 million or even considerably less, there is a tremendous growth in terms of the requirement of resource requirement and when one considers the attitude toward population, may I ask you how you approach the problem on population?

Many of our scholars and thinkers in the field are talking about zero growth; what is your attitude toward that?

Dr. Boulding. Well, of course, in the United States the outlook is optimistic, in that the fertility has been declining very rapidly in the last 10 years; if it continues to decline at this rate, which it probably won't, we will be in sight of a stationary population by the end of the century, but, as I say, this could be wrong.

If this goes on we may not be able to do much about it. I have my own solution to this problem, but nobody is taking it seriously.

I have my green stamps plan for population where everybody gets 110 green stamps which entitles you to one legal child. We don't want the government breathing down our necks in the bedroom, which is rightly something private.

On the other hand, we may have to face some kind of social regulation and, of course, the problem is how do you have social control without intolerable intervention in individual liberties. That, of course, is a problem you gentlemen face all the time.

Mr. Cohelan. Thank you.

Mr. Brademas. Mr. Hansen.

Mr. Hansen. Thank you, Mr. Chairman, and Dr. Boulding, for the most useful contribution you made. You have made some reference in your statement to the international dimensions of the problems of polluting the environment. Obviously, pollution does not know national boundaries and in any long-range effective solution it has to involve cooperation across the national boundaries.

Let me ask you two questions with respect to the international aspects of the problem:

First of all, to what extent are we ahead or behind other parts of the world in this awakening that we have just experienced to the nature of the threat? And, what institutions or mechanisms do you see that are promising as the basis of the kind of cooperative international effort that will be needed to preserve the quality of the air, of the water, of the world that we live in?

Dr. Boulding. Well, with regard to the first question, the only part of the world that I think is very much aroused about these problems in Western Europe. The Socialist countries have only just become aware of them and I notice that the Russians have been all excited about this this year. I think they have had even worse ecological disasters than we have had and one of the things in this whole area is that socialism is no answer to anything; look what the Russians have done to the Caspian Sea, they messed it up completely, the Volga is a disaster and they plowed up plains that they shouldn't have, and all sorts of things they have done. The other socialist countries have met disasters also but they are beginning to be aware of this.

Now, I am struck, when I go back to my native country of England, of the extraordinary improvement over the last 10 years.

Now, I am a native of Liverpool and it was a filthy city. If you think environments today are bad, you should have seen what I had to smell as a child in Liverpool; but today it is very much better, which suggests that these things can be improved.

Actually the British have an easier problem in the sense of coal, that coal is easier to clean up than the pollution on an inversion, for instance, such as we have in Los Angeles. But they have done certainly a great deal about it.

On the matter of international organization, I would like to see the United Nations in this area. I am hopeful that the United Nations conference on this subject in 1972 will produce a United Nations organization in this field. This is very badly needed because, as you say, pollution knows no national boundaries at all.

Our pollution does go out over the Atlantic and most of it disappears before it gets to Europe but things like radioactive pollution or DDT pollution requires an international organization.

Mr. HANSEN. Thank you very much.

Mr. BRADEMAS. I have just one other question, Dr. Boulding. One of the witnesses on this legislation was Prof. Joseph Sittler, of the University of Chicago, and he told me that he is writing a book which will have the title of "Theology of Ecology," which is trying to draw some implications for religious thought, of the increase of awareness of environmental problems.

I know that you reflected on some of those relationships as well, and I wonder if you have any comment on that development?

Dr. BOULDING. Well, I think this is ultimately, certainly, an ethical problem and I think one can almost say a theological problem in the wide sense of the word, in the sense that it involves the nature meaning of the universe and of the whole human enterprise.

This is a very profound change in man's image of himself in the sense that up to now he has always lived, and he has been expanding, in what seemed like an almost infinite earth. This presentation is the juncture where we suddenly realize that the earth is a small spaceship and that it is closed. This happened in my lifetime. When I was a boy in school, there was still white space on the globe with nobody there. Now there aren't any.

Now we have been on the other side of the moon. One of the results of the space enterprise is to make us very lonely because it is clear that this is the only decent bit of real estate in this part of the universe and that we better look after it!

Now, the traditional religious concept which is appropriate to this problem is the concept of stewardship, that man is the steward of the earth and all of which it contains which, of course, is a very important concept in the Christian tradition and also in eastern religions; I think this is an almost universal religious concept.

This is one that has to form the ethical and religious basis of the spaceship earth.

Mr. BRADEMAS. Well, I know, Dr. Boulding, you have contributed enormously to the dialog on this issue. We are grateful to you for that. Your testimony has been most eloquent and we want to wish you a happy 21st birthday as an American, as you go into your third decade in citizenship.

Mr. REID. And many, many happy returns in the future.

Mr. BRADEMAS. Thank you very much, Dr. Boulding. We will take a brief recess.

(Recess taken.)

Mr. BRADEMAS. The Chair wishes to read some excerpts from a letter that he has just received from the Honorable Jess Unruh of the Fifth Assembly District of California. The entire text of the letter will be included at this point in the record, unless there is objection.

(The letter referred to follows:)

APRIL 28, 1970.

Hon. JOHN BRADEMAS,
House Office Building,
Washington, D.C.

DEAR JOHN: I want you to know how much I regret not being able to respond to your invitation to appear at the field hearings in San Francisco before the

Select Subcommittee on Education on behalf of your Environmental Quality Education Act. I should at least like to take the opportunity to present my thoughts on the subject, since it is of much concern to me.

I am concerned with what is happening not only to our State, but to our entire physical and social environment. But in searching for actions which can best help us respond, I am beginning to see relationships between disruptions to the biological ecosystem and disruptions to what I might call "the ecology of social relations," the "ecology of political responsiveness," and the "ecology of institutional structure." In every case, these disruptions take the form in which the separate functions of the parts no longer contribute to the well-being of the whole. In nature this spells biological disaster; in government, this spells institutional inadequacy.

I see much more in the Environmental Quality Act than just a stimulus toward environmental education. I see it as a first step in helping to redefine both educational and governmental institutions in ways that can make both more responsive to the needs of today. And I see our ultimate survival hinging upon both types of response.

The remarkable feature of the modern conservation movement is that we in government are being educated and counseled by those students and people who care. And as I see it, your bill would provide assistance for programs that would originate within the colleges and high schools and grammar schools, as well as those programs that would originate within the communities. The thrust of your bill is to have these same programs reach out to those who are already out of school, who are either themselves teaching school, or who are making the policies which affect the destiny of our State, while also permeating all levels of education.

In my opinion, this provides an essential balance.

Perhaps, at long last, this will help us to get away from the "wise use of natural resources" as our only way of environmental thought, and bring us closer to "the wise understanding of the natural world."

In the Environmental Quality Education Act, I see a unique opportunity to assist people to re-educate themselves, and to stimulate states and communities to play a much more constructive role in determining the quality of their own future.

Passage of your bill, and the appropriation of sufficient funds in support of your program, would have immediate benefit in California on two fronts: first, it would help us define a better structure for our State and local educational institutions, to meet the needs of today's society; and second, it would provide financial assistance to enable us to move ahead without further delay with our own environmental education programs. We are in the shameful position in California of having passed laws requiring conservation education and counseling in grades one through twelve, without having appropriated any state funds to support this.

It is clear from the intent of the Environmental Quality Education Act that the states could not rely solely on federal support, but rather that federal funds would be used to supplement State funds. I applaud this feature, for it means that California will have to recognize its own responsibility to the national effort: California will have to act, rather than just talk about environmental education.

I sincerely hope that not only will the Environmental Quality Education Act be written into law by Congress and by the President, but that it will receive the benefit of a major appropriation of funds, so that it won't suffer the fate of our conservation education programs in California.

I might venture to add that, at a time in which the "reordering of priorities" appears to be the order of the day, we might weigh the environmental impact of the federal government's $290 million in funds, presently slated to support a technological boondoggle which I do not wish to see over the State of California—the SST—with the impact that the same amount of funds would have in supporting the programs spelled out in the Environmental Quality Education Act If there were ever a need for new priorities, and an immediate reduction of institutional response, this is certainly one.

Let me know if I may be of further service.

Sincerely,

JESS UNRUH,
Assemblyman, Fifth Assembly District.

Mr. BRADEMAS. The next witness before our subcommittee is Dr. Donald Aitken, the director of the John Muir Institute and professor of physics at Stanford University who has been a person very active indeed in the present movement to dramatize for the American people the environmental crisis.

We are pleased to welcome you to our subcommittee this morning.

STATEMENT OF DR. DONALD W. AITKEN, DIRECTOR, JOHN MUIR INSTITUTE

Dr. AITKEN. Thank you. I am also a director of the Friends of the Earth and they are largely responsible for the program referred to in this program.

Congressman Brademas and members of the Select Subcommittee on Education, I am very pleased to be here. I am also pleased to see a representative contingent of the people who are going to be affected by your bill. There is a group from the Peninsula School in Menlo Park, Calif., here, and I am also pleased to see Jim Harding, who is the head of the nationally famous high school program of Environmental Awareness which is being written up in a handbook and I think there is some concern as to the kind of education which is going to be facing them.

I was surprised at Kenneth Boulding's reference to beautification. It shows me that he didn't study this week's lesson—it is actually last week's lesson of Procter & Gamble's and this is Proctor & Gamble's lesson which says that it really isn't so bad and that is part of the ecological education that we are getting now.

I am going to address myself to it and I know that Jerry Mander also will address himself to it.

Congressman Brademas, members of the Select Subcommittee on Education, I have several tasks to accomplish in this brief presentation:

I want to show that without passage of the Environmental Quality Education Act we shall probably have no significant environmental education outside of the colleges in California.

I want to show that without passage of the Environmental Quality Education Act the environmental education that we do have is in danger of being dominated by industry-supplied materials and industry-oriented attitudes.

I want to argue for great flexibility in the management of the initial educational program, so that environmental education can be defined by field experience rather than by committee majority decision.

You have evidently tried to define the structure of the educational programs. It is going to define itself, from within, in the colleges, in the schools, in the communities—there will have to be room for that.

Finally, I want to argue for a sufficient annual appropriation—probably more than $100 million—to enable the Environmental Quality Education Act to stimulate an effective educational experiment.

I am going to give a little history since you are in California and to show very well how far you can go without getting anywhere. California has been a good lesson in that.

The first real concern in our State for defining a program in environmental education began in early 1966. This led to a conference in mid-1966, to the creation of an advisory committee in early 1967: to the issuance of a report in late 1969 and to nothing at all in 1970.

The desired balance between industry and conservation was maintained on the Conservation Education Advisory Committee by appointing as one of the nine policymaking members the project manager for the Walt Disney Productions Mineral King Development.

In 1968 a major revision to the California Education Code was passed as senate bill 1, making it mandatory that instruction in grades 1 through 12 should include—and I quote "* * * protection and conservation of resources * * *" and "* * * man's relations to his human and natural environment."

No State funds have been allocated for materials or teacher training in support of this law.

Again in 1968, senate bill 206 was passed in California, creating a Conservation Education Service in the Department of Education, and permitting the department to make grants to local districts for programs in conservation education. This, too, was passed without appropriation of any funds.

Senate bill 1392 in 1969, to provide $125,000 to start these 1968 programs—that bill died in committee.

This year the Reagan administration said it would appropriate $176,000 from State general funds for conservation education, but this item was absent from the State budget. The last we have heard is that California will disavow its own responsibility by asking the Federal Government to give us the $176,000.

The greatest irony of this little game is that $176,000 won't begin to meet our minimal needs in conservation education in California. This amounts to 4 cents per school child in grades 1 through 12 in the California school system; 4 cents to learn how to survive.

And now we have assembly bill 1050 by Milias, attempting to appropriate $10 million—which is a more reasonable figure—to implement the conclusions of the conservation education advisory committee. The funding formula spelled out in the bill has already been killed in committee and the chances for passage of the bill are remote.

So here we stand, with our State not willing to provide for the implementation of its own laws. It feels it is enough to legislate on behalf of conservation education as long as it doesn't have to do anything about it. That is a great 4-year history.

I believe that this stumbling block will only be circumvented if and when Federal support for environmental education is made available in significant amounts, but with the condition that the State earn these funds in some way through actions of its own. Without passage of your bill, I feel there is little hope for more than we have, which is absolutely nothing.

I smiled in sympathy as I read the P.G. & E. ads in our newspapers and our national media, of how "* * * P.G. & E. puts a smile on Mother Nature's face"; and I detected a grimace instead of a smile.

I read with interest the Shell Oil ads, teaching us how to manage local ponds with chemicals.

I have read with awe the Atlantic-Richfield ads, especially the last one, which told us that Atlantic-Richfield is willing to go to the end—if you look at the ad, not to the end but to the ends of the earth—in support of the local neighborhood dealers, and I have marveled at all that black stuff that ends up in those balloons from cars that use Chevron gasoline without F-310, and wondered why that stuff does not come out of other cars.

My reason for making these observations is that a tremendous amount of money has gone into these completely phony education efforts.

Last week, the day before the environmental teach-in—excuse me, the wrong end—we had P.G. & E.'s latest contribution to ecology education. If you try to deliberately structure the lesson in ecology based on scientific and genuine misrepresentation you couldn't do better than this ad has done.

Now, Congressman Reid has made reference to his doubt before over the promise of nuclear generation. I will read one brief section here in this ad:

> All evidence points unmistakably to nuclear generation, to the answer that man's nuclear plants are efficient, they are economical, they are safe, they are clean.

And there is the ecology lesson for the week. I will show you the ad again because I find it very significant because there is an article about Cambodia just above the ad. I discovered this just last night.

And I can see just as much of the same money going into the provision of materials for environmental education in our schools. In some ways I see it already.

Alaska, for example, is distributing a film entitled "New for Tomorrow," which was presumably produced by the State of Alaska—it says so in the film—but which was actually paid for by the oil companies. As this film travels to the Alaskan schools it not only shows incidentally that the oil companies are not causing any damage to the north slope, but it also purports to show sockeye salmon—a species that cannot even be found in the Arctic—merrily swimming the streams on the north slope that are left unpolluted by the oil operations.

I believe that the oil companies probably are not polluting those streams, but why fake nature to make this point?

These are the kinds of lessons in conservation and ecology that I fear and these are the only kinds that are distributed to us and all of the schoolchildren and this is because we do not have the resources to make real environmental education materials available on a mass level.

It is urgent that we obtain Federal support for a major crash program in the preparation and distribution in quantity of useful and nonmisleading materials for assistance in conservation and enviroment education. We should not have to rely, as we do now, on industrial films and pamphlets. This should be the first priority and I suggest the major budgetary item upon passage, I hope, of the Environmental Quality Education Act. We could be doing so much more now if the materials were available to us.

Environmental education is an experiment. I did allude to that in the opening remarks of this talk. The most effective means for educating in this difficult subject must evolve through numerous and diverse types of exploratory efforts such as the type of experiment I observed and took part in in a couple of high schools.

A symposium, presented about 4 months ago by the American Association for the Advancement of Science, provided a forum in which we saw how much professional disagreement there is on what we are educating for and how it should best be accomplished.

I would like to give you a couple of examples and then explain how it is pertinent to the hearing today.

A U.S. Senator wrote that:

> * * * we must begin now to train men and women to meet the challenge by making environmental science a specialized discipline.

I couldn't disagree more. It is not a science but an amalgamation of sciences in the interest of the unspecialized application of each to a larger effort—to a larger field.

A well-known educator in environmental science argued for:

> * * * the creation of structures which treat environmental science in precisely the same way as we now treat chemistry or physics or mathematics, with a department, a faculty and a major concentration for students on the undergraduate level.

I couldn't disagree more. We can only succeed if we can break down the stultifying departmental structure which continues to hamper our efforts at cross-discipline fertilization of ideas, and our environmental education must pervade all fields. It is the nonmajor who most needs to absorb the principles of survival.

A representative of the National Park Service wrote and I quote:

> I would place this interdisciplinary education above specialist education for the immediate future.

He is obviously far away from the Senator's view, but I also have to disagree with this one. Both types of education are needed so that we do get at least some specialists very soon who can meet the highly complex technical demands of environmental recovery and protection.

And, finally, one of your cosponsors on the Environmental Quality Education Act wrote that:

> * * * we must have well-trained environmental scientists if we are to deal responsibly with the problems raised by technical developments such as the supersonic transport.

Now, this would appear to support what I just said—it starts out to—but I do not think it does by the time it's through, because the SST is one of those problems that has no technical solution and we cannot train environmental scientists to come up with one. We can only deal responsibly with it by avoiding it and that decision won't originate with the environmental scientists—it is a social decision.

Our environmental education has to provide us with the perspective to see these differences and the thrust of the educational program that you are visualizing must somehow also help us impart this perspective to the very same people to whom we are teaching environmental science.

One of my purposes, really, for illustrating these diverse views—including my own that I have just quoted—is to show that I have just quoted the very same people who might be picked to fill your advisory committee of 21. Their reputations are all quite solid and their accomplishments have been good. Can you see them together?

You would not go to Ithaca, N.Y., for example, and ask a young high school biology teacher named Mark Terry to serve on such a distinguished panel of experts. And yet Mark Terry is writing an important book called "Teaching for Survival," and he is teaching a very good class—in short he is out doing environmental education.

Mr. Chairman, there are thousands of Mark Terrys in our country. I have seen many as students in our junior colleges here in California and they are the resource that we are after, to help us teach the younger students.

Somehow your advisory committee of 21, and the entire initial program, must be structured in such a way that it will allow it to listen to the Mark Terrys and to respond to the impact of their efforts. Those who are going to make the Environmental Quality Education Act succeed are not yet famous and should not be appointed because they are famous.

And I would hope that you do not strive to share to have representation of all views guiding your educational experiments as we have done to a ridiculous extent in California. The only view that you need represented is a genuine dedication to ecology environment.

We are not obligated to teach our young how to be real estate developers as well as conservationists and then to give them the choice. We must teach them only to be conservationists and then hope that they can be real estate developers without losing the conservation perspective—if this is not a conflict of terms.

Finally I should like to talk about funding your program. We have seen in California what happens when educational bills are written into law without sufficient appropriations or without any appropriations, for that matter.

The Milias bill now in our assembly, AB 1050, calls for $10 million in California alone to start teaching 4½ million children in grades 1 through 12 in California schools how to survive.

If this fairly represents a per capita value for this particularly necessary education, this amount, $2.20 per schoolchild per year, exclusive of college, then the value of your entire national package would be about 10 times that or $100 million. This is how I quoted the figure.

This is not a fair assessment, thought, because each State has its own particular environmental problems and needs. Educational materials will have to be prepared regionally; course content must differ from State to State and county to county in order to make it relevant to the world that the student experiences when he goes outside.

So I would guess for a starter, certainly twice that amount or about $200 million. That is still only $4 million per State on the average or $4.40 per schoolchild per year.

Well, if we allow ourselves the luxury of almost three times the Milias per capita rate or $290 million, we are almost exactly to the amount that Mr. Nixon wants to spend on our first unsolvable environmental problem, the SST—and I just read Jess Unruh's statement, and I heard your reading of it—and I share Jess Unruh's worries about priorities that allow us to spend $290 million in opposition to the environment but which will probably allow us to spend only a fraction of that in support of educating for survival.

Fundraising for environmental education is going to have to be imaginative. Is it unreasonable, for example, to suggest that Federal funds also be allocated in quantity for purchasing open space in and around urban areas in the interest of providing field sites for environmental study—and this was dwelt upon, to some extent, in the report of the Conservation Environment Committee, the need for field sites—so that urban and ghetto children are guaranteed the opportunity to see a little of nature?

Couldn't these areas then be purchased back by the cities and the States later on as funds are available for park acquisition? You might call this an educational land trust.

Couldn't we use billions of Federal dollars in such a loan capacity like this to buy land, time, and conservation education—all in one package—while also holding the line on land values for future park and open space acquisition?

I know this may sound to be quite farfetched. But survival is also farfetched, and so is 1970 when viewed from 1870; and to me right now the year 2000 is farfetched.

I am going to close by referring to one sentence from the 1969 report of the California Conservation Education Advisory Committee, and I quote:

> Decisions regarding man's use of the environment must be based on economic feasibility, social acceptability and political reality.

The heavy hand of Disneyland shows in that statement.

It is urgent that the Environmental Quality Education Act be passed into law and its success will be measured in its ability to help us redefine all three of those concepts: Economic feasibility, social acceptability and political reality, so that survival and the quality environment both become economically feasible, socially acceptable and politically possible. According to present theory and practice they are not. We need your support to change this.

Thank you very much.

Mr. Brademas. Thank you, Dr. Aitken. This is a most valuable statement. I have several questions to put to you quickly.

Dr. Aitken. Yes.

Mr. Brademas. Did I take you to be saying when you made the point on page 3 of your statement that you felt that Federal funds ought to go to States on condition that they earn the funds in some way, did I take you to be saying that the environmental education program ought to insist on matching State moneys; or not?

Dr. Aitken. Well, I use the word "effort" as I recall, or "action," rather than money.

If we are talking about $100 million, a $100 million program, it is going to be difficult for the States to match funds on a 1-to-1 basis, but the States are going to have to concern themselves with their environmental quality here.

We hear the politicians in the State say that they are concerned. The State, I think, will have to accept its responsibility by requiring to take some funds, in other words, to set up a department of conservation education, to see to it that the materials are prepared and distributed in the State that are relevant to that State, that will require some State funding and the use of State people. It will require, I think, some additional State legislation.

That is the kind of support that I believe the State should give.

Mr. BRADEMAS. I was also interested to hear you say, if I read you right, that among the several kinds of activities to be funded under this act, you would give highest priority to the preparation of teaching materials and I took you to be saying that, failing the passage of legislation along the lines that the environmental education bill was considering, a vacuum would exist into which would rush a number of the industries that are guilty of doing the most polluting in the country with self-serving allegedly educational programs.

Dr. AITKEN. Your interpretation is correct of what I said. I venture that it already shows as to how it is beginning to happen. I don't want to restrict myself to school media; I should really refer to Jerry Mander who is an expert and speaks about the meaning of responsibility.

But the two ads I showed to you, the full-page ads, are reaching everyone who reads them. We have no way of providing any counter ad.

I would love to see us do a full-page ad and point-for-point disccuss the inadequacy and inaccuracies of the P.G. & E. ecological lesson.

Mr. BRADEMAS. You are aware of the fact that the FCC made a ruling with respect to commercials for cigarettes, to the effect that radio and television stations had to provide equal time to show the dangers to health of smoking. What would you think about impressing upon the FCC an analogous proposal; namely, that polluting industries that advertise on radio and TV their products might find themselves faced with advertisements, commercials that are pointing to the dangers to the environment of activities in which those industries engage?

Dr. AITKEN. I would be very much in favor of it. I would like to point out to you that Friends of The Earth have already started by filing with the FCC a complaint asking for what amounts to almost equal time—it isn't really—to counter some of the automobile ads since automobiles themselves are dangerous to health and the last time I heard was that the action was denied by the FCC and I would suggest to you that it is now time for a bill to help support precisely that.

Mr. BRADEMAS. I have just one other question. I noted with great interest that you call for the use of Federal funds for purchasing open space in and around urban areas to provide field sites for environmental studies so that urban and ghettto children in particular could be guaranteed to have a chance of seeing a little bit of nature.

I have in front of me a letter of which I will ask unanimous consent to insert in the record, an official of the Audubon Society responding to an inquiry that I put to the society the other day about the Audubon camps and the nature centers that that society has sponsored for some years, and they tell me in this letter that, if there were a federally supported program of community nature centers development, that although the cost varied from project to project, "It is our judgment," they say, "that a planning grant of $6,000 and an initial operating grant of $30,000, $10,000 a year for 3 years for each project, would be sufficient," so that you would have a total of $36,000 for each qualifying project and, if you were to establish an annual program of 50 new nature centers, the result would be a budget of something under $2 million a year.

Is this the kind of enterprise you are talking about?

Dr. Aitken. Very much so. Audubon has a history of doing extremely well with very little. They are doing extremely well with public support.

That raises a point that I was just alluding to, that is the importance of taking whatever funds that you can get in support of this act and distributing it in little bits and pieces, so that everybody, you see, makes maximum use of what you have.

If Sanford University would come in and the school of education would come in with a proposal of $500,000, I would hope that it would not be accepted; if Fullerton Junior College and San Mateo Junior College, Foothill Junior College, if these were to come in with proposals for $10,000 to support the marvelous experiments they are doing already, I hope they would be supported.

I would hope that there is $2 million to the National Audubon Society.

Extending it beyond that, I was trying to see, to make funds available—even though they are not specifically allocable to this act—namely, help us purchase the greenbelts that we need. That is critical.

Purchases on behalf of education, people worry about putting lands in trust, putting lands into posterity, but it also has a value, that land in and around the cities, and I can see these things being linked with a major Department of Interior program on land acquisition and enlarging the usefulness of the entire act. I suggest it only as one of the many suggestions.

Mr. Brademas. So you like the idea of what some of our witnesses have called making private nonprofit organizations eligible for minigrants, as they have put it?

Dr. Aitken. Indeed.

Mr. Brademas. Thank you very much. Mr. Reid.

Mr. Reid. Thank you very much, Dr. Aitken, for your very thoughtful, excellent testimony. I think you are entirely correct that we will need to reorganize our national priorities. We are a long way from having adequate funds for air and water pollution, let alone in the educational area that we are concerned with this morning.

The matter of $176,000 which is provided, I believe, in the California budget—I am not sure that New York is doing much better.

Specifically, I would like to ask you about one portion of your testimony where you dealt with the need for cross-fertilization and discipline. It is my experience that the Atomic Energy Commission is essentially defensive and tends, at times, to question not only the accuracy but the credentials of scientists in other disciplines such as genetics.

Secondly, we have a corollary problem of disciplines not coming together to identify the problem. The Department of Agriculture released standards on pesticides without consulting the fish—let alone human beings.

The AEC tends to set standards as well as advocate the development of atomic reactors and I would ask you very simply, how do you think we can best get the disciplines to agree on specifics, the problem of the interrelation of the chemical or radiological, within the life cycles of our entire planet—and how can we best set up a mechanism—perhaps through the President's Council on the Environment—so that those who are promoting——

Dr. AITKEN. You can set up the mechanism by simply having perhaps the Council ask the right questions, in fact start asking questions at all.

I think you can begin by not setting up anything as far as the study goes, but by making use of what we have. I will give you two quick examples:

Something like 120 extremely good scientists on the east coast, centered at MIT, formed the Union of Concerned Scientists and they are willing to bring themselves together, and they represent six or eight different disciplines—I don't quite recall that—to bring themselves together and provide resource material any time they are asked for that material by congressional committees, by a college, by a local district.

The other organizations, the American Association for the Advancement of Science which is just beginning to try to move to make itself move effective, and they are planning to begin supporting a series of studies, major scientific studies, and one of them regards, for example, the relative pollution of power production—although we read this interesting P.G. & E. statement that we are going to, unmistakeably, to power production—but it is not unmistakeable; no one knows which is the most or least pollution.

There is an independent group of scientists who on their support and initiative are willing to give you some of the data in the next couple of years.

Mr. REID. That would be helpful, but let me ask one follow-up question specifically:

As an example I would give you the fact that, on radiation standards and pollution standards, the AEC says that the levels are all right and various other people are saying that they should be reduced 10 times lower, and this doesn't only include radiation, it includes tridium for genetic reasons. How can we start to get some standards and are there standards that you know of and that you have confidence in?

Dr. AITKEN. No. There are no standards that I have confidence in. You are familiar with the Rack Commission, of course, and the substance of the 700 report is to point out that there is no scientific basis, there are no scientific standards of a minimum allowable, and that it is going to take a lot of research to come up with new standards.

What we have to do now is to become suspicious. If we begin to doubt the scientific value of all the standards, then we should not do as PG&E does, well, the nuclear plants are well below the standards because we are finding out specially in the nuclear problem that the standards are absolutely garbage.

We've got to become terribly, terribly suspicious. And you will find an awful lot of people, I am one, and there are an awful lot of other scientists, who are willing to redirect their careers to try to provide some of this.

Mr. Reid. On the tridium, have you not seen some evidence that is highly suspicious that the tridium may be responsible for the——

Dr. Aitken. Well, I am going to have to be cautious here. It is suspicious, yes. It is difficult to say. The power companies point out that you can only add to it 2 percent radiation background by the year 2000. Nature doesn't have the 2 percent. Also 2 percent of what? It is not 2 percent of the natural radiation content that comes through the atmosphere in cosmic rays, it is a different kind of radiation.

Well, my thesis is again—and you are pointing it out very well—that we have to be highly suspicious of people talking about standards and that it is unmistakeable that nuclear plants are the thing of the future.

It is pointed out by the Commission how bad it has been. I wish we didn't have to have these things pointed out to us by the damage that they cause, namely the catfish dying. It strikes me that one could ask this question before they die and if you realize the responsibility to the environmeint, we've got to say that—let's ask the questions now, and that is the signal reordering of priority I am advocating in this book.

Thank you.

Mr. Brademas. Mr. Hansen.

Mr. Hansen. My thanks to you also, Dr. Aitken, for an excellent statement.

I think you have powerfully emphasized the importance of making a very substantial investment in the kinds of programs that are anticipated by this bill, but let me ask you if you don't agree that there is also a great deal that we can and should do, even without additional funds.

It seems to me that there is a very large body of knowledge accumulated over the ages of the causes and consequences of pollution of the environment. There are sources of knowledge that we can tap.

So apart from putting additional amounts of money into these programs, can't we do a lot more in the redirection, in the reshaping of our educational program in order to emphasize the relationship to the environment?

Dr. Aitken. Well, I will answer both yes and no to that. There is a tremendous amount of work that has been done and there are a lot of materials available.

The ecology center in the bay area has been working terribly hard to draw together available materials, published a biography to show that they are available, but it doesn't do you any good if you can't afford to buy them and if you can't afford to reprint them and distribute them.

So one can begin to acknowledge the biographies and in pointing out what we have and making it available and immediately supplementing it; I didn't want to diminish the importance of teaching the teachers now in favor of getting materials out, but teaching the teachers is going to take time, whereas we have materials that we can get out right now and even teachers who are themselves untrained in environmental questions could use very good materials given to them in a very effective way.

So it is a somewhat ambiguous answer, I am afraid, to what you have asked.

Mr. HANSEN. May I ask one final question:

You make reference to the provision in the bill for an advisory council and lamented the fact that probably it would not include someone such as Mark Terry. I would ask you if you have any suggestion for modifications in the bill—assuming that an advisory council is desirable and, if not, I would appreciate your comment on that—but if it is desirable, how can the bill be changed in a way that someone such as a Mark Terry might be likely to be appointed to the council?

Dr. AITKEN. Well, I fear an advisory committee that is given power which is what I think I am saying.

We ought to be—well, I started to write into my speech and my wife made me pull it out—that if any of your candidates is famous he automatically would not be considered for the committee. I think it would be possible to go out and to find the people who locally have made a reputation through their own actions for doing very well and to let them be the advisory committee.

Now, how that can be worked into the bill, right now I find it difficult to suggest here; I would be happy to sit down and think about it and submit in writing my suggestions for doing this.

I would prefer to see a much smaller advisory committee and rather have it a committee that watches, distributes the funds, watches what happens, take the very best of what happens and let that shape the program, let that advise the future program; let the advisory committee be bright enough to evaluate and recognize what is going on without each one blowing his own educational horn and following his own program that he has been publishing for years, you see.

I can't give you quite the answer I want now, but I will be happy to try.

Mr. HANSEN. We will be grateful for any suggestion you have on the language changes that we would consider when we prepare the final draft of the bill.

Thank you again for an enormously good contribution.

Mr. BRADEMAS. I wish to make a couple of other points because you touched on them. I was not aware of the fact that the State of California was not putting any money into conservation education programs as your testimony indicates. I had thought that this State was one of the leaders in this respect.

And in Los Angeles tomorrow we will be hearing from one of the consultants to your State Department of Education; $176,000 for a State of this size in an area like conservation education, as it is called in this State, seems to me to be most modest and that your Governor apparently has not included that in his State budget I find distressing.

I was also interested in your earlier comments about the advertisement that a number of industries are now beginning to publish in the newspapers, on television, and on radio. You may be interested to know by way of my giving to you this footnote that I happen to have been an overseer in the university and got myself into something of a controversy out there the other day when I told my fellow overseers that I supported Mr. Nader's campaign of GM, and I would like to express the hope since I find myself in this great State that those persons who hold GM stock will also, before the May 22 meeting of the annual meeting of the GM management, decide to vote their stock with the Committee for Corporate Responsibility whose proposals I find, I must say, very modest indeed.

That's just an unsolicited testimonal that I take advantage of my presence in California to offer.

Dr. AITKEN. You may have seen the GM ad in the Life magazine article about it. I've got to warn you, Congressman Brademas, your academic credentials that I know about are showing which may not get you further in politics.

Mr. BRADEMAS. Well, I try to rise above them. [Laughter.]

Dr. Aitken, your testimony has been most valuable and we are very grateful to you for having come.

Mr. BRADEMAS. Our next witness is the representative of the Sierra Club. The Chair would like to observe that earlier today we were pleased to have with us Mr. Michael McCloskey of the Sierra Club but he had to leave to fill another commitment, but we are, however, pleased to welcome as a witness on behalf of the Sierra Club Mrs. Peggy Wayburn.

We are pleased to see you. Go right ahead.

STATEMENT OF MRS. PEGGY WAYBURN, SIERRA CLUB, VICE PRESIDENT, ADVISORY COMMITTEE ON CONSERVATION EDUCATION, CALIFORNIA STATE BOARD OF EDUCATION

Mrs. WAYBURN. Thank you very much. Mr. Brademas and members of the committee, I am very happy to be here.

The reason I have been asked to testify for the Sierra Club is twofold:

First, I have been very active in the club itself and, second, I have served as vice chairman of the committee which has just been under discussion. That is the advisory committee on conservation education for the California State Board of Education. I have been vice chairman of this committee for the 3 years it has been in existence.

So I have been working firsthand and struggling with a lot of these problems that we have just been talking about.

I have to agree that it is rather remarkable and I think very disgraceful—that a State like California has not been able to find any money to implement the conservation education programs which we have very carefully, and after a great deal of agony, come up with. I will be glad to answer questions on that later.

I would just briefly like to speak about the Sierra Club and what it has done in the field of education. Whenever I start this kind of testimony, I come to the fact that the club has so many members in it now that that fact needs to be mentioned.

Mr. REID. You have a few members right here on this panel.

Mrs. WAYBURN. I appreciate that. The club was founded about 75 years ago here in the bay area and we had 182 charter members. Today membership is approaching 100,000 people.

Our major concern has always been the environment, as I am sure you know; first it was the Sierra Nevada, then it was throughout the rest of the country and then it became the whole problem of man's total environment.

We have, since our founding, been publishing educational materials, trying to reach the public, trying to make people aware of what has been happening to the environment. Our publications beginnings were small, but as you know, our publication effort has become very large.

We have always been concerned about formal education. We have never actually had the means to go into this on a professional basis, simply because we are a volunteer organization. I thought it was worth noting that the club does have one small textbook on conservation education, and I would like to enter it as part of the record of this hearing. It is a book called "How to Teach Wilderness Conservation," and it was published a long time before ecology and environment became such popular subjects.

This, incidentally, was prepared by a teacher member of the club and was published by the San Francisco chapter.

There has been a good deal of conservation education effort within the club on a local community basis. By the way, I would just like to mention that this term "conservation education," is, I think, a sort of confusing one. I much prefer the definition of "Environmental Quality Education," and I think it is worth noting that the advisory committee here in California had a great deal of discussion on this matter of semantics and what term best describes the kind of education we're talking about.

I would like to use the two terms interchangeably, simply because it is sort of a standard reference, the conservation education tag.

The Service Club would first like to commend all of you who have introduced this bill, H.R. 14753. We think it is a major step; we think it is very hopeful that Congress is getting into this scene which is so terribly important. We congratulate you on precipitating this action. It is long overdue and we strongly support and endorse the principles which are spelled out in this bill.

At the same time, we do feel that the bill as it is presently drafted is not succinct enough, does not define the problem strongly enough nor broadly enough and does not go far enough in its specifics to really meet the needs that are facing all of us now in understanding the cause of our environmental problems.

Dr. Aitken has outlined for you what is happening here in the State of California, the fact that we have recognized that we need strong conservation education in our schools. We have had a great deal of study and we have spent a lot of time in the past 3 years, and yet we still don't have anything, simply because our legislature did not come up with a bill with teeth in it. We did not have a bill for adequate funding, spelling out what could be done with adequate funding. We speak here from sad experience in our own State and we are urging you in your bill to come to grips more definitely with the specifics and we have certain suggestions along this line.

I would like to refer back to the launching of the first sputnik in the 1950's when there was a sudden alarm on the part of everybody in educational circles in this country. We had a great educational gap and it was recognized as a crisis. We decided that we would reform our whole educational approach and we did so.

I think that the crisis today is far, far greater than it was at the time of the first sputnik. We have a much more profound educational gap. It is a much more dangerous one. I think we must respond to the crisis today even as we did then, in terms of crash programs.

Now, this crisis has to be articulated and we have to try to really understand the problems that face us.

We have this sort of—well, it's a gap between reality and myth. We have a reality of a disintegrating environment, of everything around us. We can't escape it. We have it here in San Francisco today. We've got smog around us—something that we just thought would never happen, but here it is. This is a reality and we can't get away from it.

We also have in San Francisco the reality—and the myth—of what we do with our garbage. This is a very interesting sort of a problem and I think it is part of this whole thing that faces us. We have for centuries been shuffling our garbage around. Traditionally in America, we move it from one place to another. We have never really gotten rid of it.

So here in San Francisco we have tried to come up with a solution of what we would do with our mounting garbage. So we decided to ship it up to the mountain counties after using up our local fill areas. When that turned out to be too expensive, why, we decided to ship it south to the peninsula and fill in a few canyons down there.

This is part of this whole gap between reality and myth. For we are not coming to grips with the situation; we simply don't have enough canyons to accommodate our garbage ad infinitum. We can't shuffle our garbage about forever; we have to meet head on the problem that we have too much undisposable waste; and this is a new, hard concept. This is a reality that is going to possibly be the end of us all unless we can meet it in terms of what it is.

We are further subscribing to the myth that we can use our natural resources on an open-end basis. I think it is high time that we stopped and looked at this again because we cannot use our natural resources on an open end basis. They are not going to be there long enough.

We have to reexamine some of our myths and come up with a recognition of the fact that we've got to change our ways. This kind of thing should be articulated and made a subject of your bill.

As you have pointed out in your bill, part of our problem is a lack of understanding. Another major part of our problem is a lack of responsibility.

Now, this has been touched on briefly by earlier witnesses who spoke of the stewardship of the earth and I think "stewardship" is a good word. So is "responsibility," and I would hope that this kind of a bill would spell out the fact that understanding and responsibility must go hand in hand in any approach to meeting our environmental problems.

One part of the bill which we feel is excellent and which has not been mentioned this morning is the fact that you do propose to reach the community in establishing educational programs for the adults in the community. We think this is essential.

We don't think there is time to wait for a whole generation of schoolchildren to be apprised of the facts of life. We think it is very important that we reach out into the community now and make available to people some good crash program on the ecological crisis.

We understand that necessarily the drafting of this kind of bill is often purposely a little vague so that it will allow for various interpretations, but we do think that there should be a more specific outline of proposed curriculums. This has already been touched on by previous witnesses.

There is no question but that the whole environmental concept, the whole idea of understanding the environment, is part and parcel of every subject in our schools. It should be so presented.

Incidentally, along these lines I think it is important to understand that our schoolchildren are not as dumb as we somehow think or like to think they are.

They are aware that when we teach our American history, we gloss over what we have done with our natural resources, and it doesn't fool the kids. I think it is high time that our American history presented the straight facts of what we have done, not only to our soil but to our timber and to our various other resources. This should be part of the environmental educational curriculums.

We urge that this curriculum begin with kindergarten, and continue all the way through higher education. In California, we have been studying what is being done in various schools because we do have, incidentally, a lot of teachers who are doing a tremendous job in putting over this whole idea. These teachers start in kindergarten, and in first grade, and very successfully get through to the kids what ecology is all about.

So we feel this is an area in the curriculum that's got to have a little more definition in your bill. There have to be guidelines to help some of the States that are not aware of what can be done.

Incidentally, our committee here in California surveyed the status of conservation education across the country and we were able to get some idea of what is taking place in many of the other States.

We endorse the idea of a commission as outlined in your bill. I would have to take issue with what Don Aitken said about giving powers to the commission. I think that your commission is necessarily going to have to have certain powers in order to get this thing off the ground. Somebody has got to do it.

There is not going to be spontaneous combustion all over the country. There are too many States where people are not aware really of what is taking place.

So I think that, while I subscribe to the idea of leaving off the famous names, you've got to have a good working commission of people who know what the score is and who can get this thing going.

I know this is a difficult thing to do, but we would hope that somehow wording can go into the bill to the effect that these have to be working environmentalists, if you will, and that the presence or absence of the degrees—with all due respect to the degrees—is not going to be an essential qualification for the people who serve on the commission. It's got to be people primarily who understand what the problem is.

We believe that funding is one of the most crucial parts of the proposed act. Of course, from our own experience here in California we have a very strong feeling about this. We know that money can be found for this kind of thing when people want to really find the money.

As an example, in California we have $16 million in our driver's education fund which seems like a tidy little amount. This has been gotten from fines from people who have broken the speed limit on our highways. We have diverted the fines from our motor vehicle department into driver education.

By the same token we would like to propose that the funding for your bill could well come from the fines levied against polluters by the Federal Government. We think there should be strict enforcement of the regulations which we now have and we have a possibility here to pick up some of the funding which is so essential.

We would also suggest that there could be exploration in the field of taxing the users of natural resources from the U.S. public lands in order to get funding for an environmental education program.

We believe that funding will be critical in many of the States. I don't think that strings should be tied on the initial funding of this act because there are too many States that are poor and too many States that don't understand.

I think that there should be available an initial funding which can get this thing off the ground and thereafter there can be matching funds or some kind of thing worked out to keep the programs going; but there are too many areas where nothing will happen without Federal funding.

I would like to just note in passing that the conservation education work here in California has been done through ESEA Federal funding. The work of the committee and the consultant of the committee were paid for out of the funds. So, as far as we have gone here in California we have gone on Federal funding. Although we have something like the fifth largest gross national product in the world, we still turn to the Federal Government.

When you have a poor State, I don't think we can expect it to come up with a going conservation education program. Furthermore, I think there is a very good chance here to hold out a carrot to people to get them going. Everybody wants money, and here is a chance to reach people who are not aware of the magnitude of the problem, to get them interested and to get them involved.

We would like to see more advantage taken of the great amount of work that has already gone into the whole field of developing environmental education. We touched on this briefly before, but there has been a great deal of excellent research.

It is specifically worth mentioning Prof. Mario Menecini's work at Davis.

We would hope that the commission would turn to completed research to help get this whole program off the ground. We would hope that the commission might be able to evaluate this research and coordinate it for use in the various States.

I will be happy to answer any questions, and would like again to reiterate the Sierra Club's commendation of your effort to launch an environmental education program on the Federal level. It is tremendous.

Mr. BRADEMAS. Thank you very much, Mrs. Wayburn, for a most helpful statement. I don't really have any questions to put to you, just a couple of observations of what you have said when you alluded to the sputnik and the role that it played in helping persuade Congress and the President to get behind the National Defense Education Act in 1958.

I thought we might emulate that precedent in that, maybe, we should have called this the National Defense and Environmental Education Act and thereby generate a little more support in this. I hope nobody takes that seriously.

The other point that I would like to make, because it seems to me fundamental to the idea behind the legislation in the minds of those of us who put it together, is that we deliberately did not call it a Conservation Education Act, we deliberately did not call it a Wilderness Education Act or a Nature Education Act, but chose the word "environmental" as we might as well have used "ecological"—as an adjective to describe the purpose of the legislation because we wanted to indicate that we were concerned with far more than the out of doors, but that we were concerned with man and his relationship to all living things, man, as it were, as part of nature.

I take it from what you have said that you would not quarrel with that kind of an approach?

Mrs. WAYBURN. Well, as I said, I subscribe to this totally. I think that this has great advantage because it lifts this legislation out of what can be a dyed-in-the-wool traditional field. That just can't do the job.

Mr. BRADEMAS. We are in agreement then. Mr. Reid.

Mr. REID. Thank you very much, Mrs. Wayburn. I want to thank you for your testimony, which has been excellent and for your pioneering work and the work of national importance of the Sierra Club and to tell you how valuable we have found it and how important it has been to helping change the national direction.

I couldn't agree with you more that we need a program and recognition that the environment needs basic help now.

I happen to be one of those who believes that we should not only end the war but we should not widen it.

Mr. BRADEMAS. Mr. Hansen.

Mr. HANSEN. Thank you, Mr. Chairman. I wish to express our deep appreciation for your help this morning. It is evident that you have not only read the bill very carefully, but that you have made a detailed analysis of it and have given us some extremely helpful suggestions that will be of assistance when we prepare the final draft.

I would only like to ask your comment on one aspect of the bill.

I would be interested in having your comment on the relative role or roles that the educational institutions, the traditional educational institutions and the noneducational institutions, private organizations, may play in implementing the objectives of this bill?

Mrs. WAYBURN. Well, I would strongly commend the idea of going beyond the traditional educational institutions—with all respect for these institutions. I have found from my own personal experience, in working on the Conservation Education Advisory Committee, that there tends to be a kind of ingrown development where certain ideas are subscribed to and it is just too hard to get off the dime and change the direction. I think we need fresh ideas, fresh approaches, and I think that there is a tremendous resource in organizations and individuals outside the educational field. They can fill a very great need.

I should mention that I think our biggest hurdle in all of this is to reach the teacher and to make the teacher understand the magnitude of the crisis that faces us. Once the teacher understands—and this has happened over and over again—he or she will cooperate and even go beyond what is presented to them. They will get their classes excited and involved and participating and that, of course, is our ultimate goal.

Mr. HANSEN. Thank you very much.

Mr. BRADEMAS. Thank you very much. Mrs. Wayburn. We much appreciate you being with us today.

Mrs. WAYBURN. Oh, by the way, I would like to give you a copy of the report of our California Advisory Committee recommendations for the record, too. I hope it may be helpful to you.

Mr. BRADEMAS. I want to observe that we have two more witnesses this morning. Our next witness is Mr. Jerry Mander, president of Freeman, Mander & Gossage Advertising.

We are pleased to have you with us. Go right ahead, sir. I wonder, Mr. Mander, because Mr. Reid must leave in 30 minutes and we have two more witnesses, if you could give us a summary. Go right ahead, sir.

STATEMENT OF JERRY MANDER, DIRECTOR, FRIENDS OF THE EARTH

Mr. MANDER. I will try to skip things, but it may take me longer to summarize than just to skip.

Mr. BRADEMAS. Go right ahead.

Mr. MANDER. Mr. Chairman, members of the subcommittee, thank you for this opportunity to comment on the proposed bill.

I assume I've been asked here today because I am a director of Friends of the Earth, but also because I am an advertising man with some observations to make about the media.

In any event, the bulk of my observations are going to be about the media and will take up an area of educational significance which is not in the bill, and perhaps should be. Dr. Aitken made some similar references in his testimony.

But first let me say that as written, I support the ideas and direction you have taken. However, I do worry mightily that it may all come to nil, even if it should pass Congress, and be turned over to Mr. Nixon for implementation. I worry particularly that in the end, millions will have been spent and nothing will have changed: that we will have educated people to want and perhaps achieve some clean rivers, say, but life styles won't have changed, and we will continue to live in a state of war between technology and the natural system: turning off gas jets while the whole house is burning down.

The goal of any ecological education program should obviously concern fundamental solutions, but I am concerned that educational programs which, for their funds, are required to get through a Federal bureaucratic maze will not be likely to be ones which present fundamental, that is, radical solutions. For example, as a practical matter, even if this bill passed gloriously, could an applicant ever really get Federal funds for a program to, say, study, design, and teach an economic and political system based on simple subsistence?

We all know that the only societies which are living in harmony with nature are those which are subsistence societies but can we really believe that Federal money would go to promoting such societies as possible alternatives to our own? Or, in another vein, would an applicant be able to obtain funds for programs which advocated reducing gross national product?

Most conservationists agree, at least many, many do, on the need for a no-growth economy, or one that is microdynamic, while being macrostatic, which is a euphemism, but I wonder what would happen to a Federal administrator who funded a project to educate people to that idea. After all, implied in the no-growth idea is a drastic reallocation of already available resources among classes of people currently on the outs—which is not what you'd call classical capitalism—and any administrator who funded such a project might be the next subject of the impeachment fad.

While I am aware that members of this subcommittee might like to see that sort of diversity represented in the handling of the funds from this bill, I don't see anything in the bill which assures it. And I am not optimistic that the present administration—or any likely ones in the near future—have the knowledge or would find it politically feasible to finance and administer educational projects which have a chance to teach people about solutions which promise to alter the economic and political structure which gave them power.

What I fear will happen instead is the sort of thing that happened to me when I was discussing an idea with the Ford Foundation for an educational program of my own device.

While dismissing my own project—an environmental advertising foundation—as hopelessly naive, this Ford man began to describe the foundation's primary efforts, which were in the education of young children toward a basic understanding of how to "better manage the environment."

I asked him what we were going to do until those children grew up and saved us, which slowed him down a little bit, and then I commented that I thought that that sort of education—managing the environment—would do far more harm than good.

The point is: We are already managing the environment and that is why we are in the mess we are; it is a further example, borrowing a page from the Women's Liberation Movement, of what let's call human chauvinism. It is true enough that we could manage the environment better than we have been, and I suppose in fairness that is what he meant, but who says we should be in charge of the thing at all?

Nobody knows the details of how life on earth happened, or can fully appreciate the immensity of the design and the variety of life forms, but still we are accustomed to think of ourselves as the end result of it all; the final flowering of the process. It hardly matters whether one believes that we were given dominion over other living things, or we just took it, but in any event our excuse is that we've got brains and can use machines, giving us some kind of de facto royalty status.

And so we remove ourselves from the processes that formed all the other living things and forget that the fabric is all connected and we are just a thread of it, and wonder why it's all unraveling.

The reason is that one life form—we—have begun unstitching things here and there, creating, weavingwise, an ecological disaster.

Obviously, the only solution is to sit there like all the other little stitches and take things as they come but we are so far from that now, so far from it, that what kind of government-administered educational program could find it politically feasible to reeducate us to the notion that we are made of the same chemical composition as a triton mollusk and are as much an accident of genetic mutation as it is—and have no greater rights of intervention in natural processes than it does?

It is far more important in my judgment, for example, that such a bill as this assures financing—instead of for a university department of natural resources—for what we might call a department of humilities; a curriculum which would be the opposite of the sort of currioulums that black studies departments have lately been introducing, whose goals are to help some people experience their potency for the first time. Humilities courses would strive for a greater feeling of impotency, respecting the limits of our man-invented technological solutions.

And more significant than "training teachers" to teach ecology, would be the granting of visiting professorships for Micronesian outislanders, or Eskimos, or other peoples already familiar with the realities of island economies and limited resources, and techniques for living in harmony with them.

If we agree that earth is an island in space, separated by insurmountable distances from any planets which might have similar resources and accoutrements, then the techniques that need developing are techniques for surviving on islands—where the seriousness of cutting down a coconut tree is fully understood—and where an industry basing itself upon cutting and selling more and more coconut trees or fish or breadfruit is, simply, outlawed.

I hope that there is a means of building into this otherwise very significant bill some protection for projects and notions which have the promise of basic solutions; some protection against the editing out of ideas by political appointees.

So much for my worries about the administration of the bill. Now, for my remaining time, I would like to discuss an educational aspect of society that is, unfortunately, at least as significant as universities and institutions, and that is advertising.

I would like to put forth the proposition that the way people behave and what they believe in today's America is at least as influenced by advertising impressions as by what they are taught in schools. This is especially true, of course, of people who do not have much of an education with which to put advertising into a context but it is also true of most of us—of all of us.

There is no way of avoiding ads today: they are everywhere, and they influence us concerning life styles, status, standards of taste and behavior, and whatever is new. They are, like it or not, the place where we gain many of our perceptions about the world, whether positive or negative. None of this might seem pertinent, but let me point out that, God save us, advertising men have discovered ecology.

At first, I thought it was a good thing that hundreds of ads began to appear from all kinds of companies, soul-searching about their own products and stating all the wonderful things they were doing to save the environment.

But as my late partner, Howard Gossage, was fond of pointing out, advertising people have an inordinate fascination with "image." They assume that by seeming a certain way, the world will come flocking around tearing at their clothes. Gossage preferred the word "identity" to "image"—having to do with the way one really is—which made him a lonely man in the advertising business.

Well, at one time, the difference may not have been all that important except for the psychic good health of advertising people. But at this point in history the way I perceive it right now, the difference may be more like life and death, and may foredoom any other educational effort that's made.

With the sudden, immense outpouring of words from business and industry concerning all the wonderful things they are doing, technologicallywise, to solve the pollution problem—most of these words being expressed in ads—it's worth having looked closely at what's being said and, of course, it's all image and no identity.

Most of the industry still sees pollution and environment questions as more of a public relations and advertising problem—in other words, an image problem—than they do anything fundamental about the way they are doing business.

Shell Oil Co., for example, recently ran a four-ad series showing:

1. How they saved the lives of a lot of fish by not polluting things as much as they had been:
2. How they are feeding starving millions by producing more and better pesticides (which on the other hand are killing the fish they just saved):
3. How they overcame a lovely little Connecticut town's fears that their new gas station would prove a blight because it would replace a number of lovely trees, by showing the townspeople that the station would itself be a lovely gas station; and
4. Came out against littering.

I'm sure that the president of that company feels he is a conservationist for this position because until recently it was unusual for an oil company to even mention pollution or ugliness. I would not be surprised if he became the industry's spokesman on protecting the environment.

Now that there is public good will in conservation, now that it's a hot topic, it's "good business to think of the environmental implications of industrial action," as a major chemical company executive recently suggested.

Another example:

A recent copy of the *New York Times* carried a Pan American Airways ad which announced the "latest breakthrough" in relieving airport congestion. I was ready to be told they had reduced their total number of flights or scrapped the Boeing 747, or canceled their SST orders.

But it turned out that what they had done was to build a second terminal at Kennedy Airport in New York, so they could handle up to twice as many passengers with less congestion inside. Getting the planes onto the gorund without bumping each other is another matter and getting into New York City from the airport, somehow, was somebody else's problem. They were doing their bit.

An we've all seen more than our share of power company ads. Usually they bring us one of four urgent messages:

1. Use more electricity.
2. The folks at your neighborhood power company are working overtime to develop new and creative means for winning the war on pollution.
3. We need more powerplants to fill our growing needs; atomic ones; and they're as safe as apple pie. (Southern California Edison, by the way, actually had the gall to blandly state in an ad 2 months ago that nuclear powerplants cause no pollution at all. They simply ignored thermal pollution and radiation.)
4. They need a rate raise to finance the research and the new construction.

I had thought I had already reached the pinnacle of my own shame and disgust concerning utility advertising—what are they doing advertising at all if they are a public utility—when I came across an old Congressional Record by chance and found in it a speech by Senator Metcalf which somehow has gone unnoticed by the press and by conservationists.

Listen to this:

Senator Metcalf pointed out that during 1969, public utilities spent nearly $300 million on advertising, more than eight times what they spend on research—all the while proclaiming in the ads how much antipollution research is going on. Metcalf also pointed out that about a fourth of all power companies in this country, actually did no research at all, while spending millions in advertising to talk about research and to sell us all on using more electrical power at the same time as they tell us there's a power shortage.

If advertising dollars are going to be spent on utilities, one would think—considering this so-called power shortage which makes introduction of polluting nuclear plants "inevitable" in the words of Newsweek—that the ads would be appeals to use less power.

I am prepared to make the case that this $300 million in advertising spent by the power companies, which by the way is about a third of the entire Federal antipollution budget in Mr. Nixon's budget message, combined with the millions from oil companies, chemical companies, auto companies, industrial associations, the newly burgeoning antipollution industries, and so on, about a billion dollars altogether this year, I would guess, much of it talking about how everything's going to be all right, just don't you worry, industry is taking care of things, is actually producing a net loss in this so-called war on pollution.

It's called "cooptation" in other circles and I believe, fairly certainly, that it's operative here, perhaps not deliberately but in effect.

I fear that all the recent Government rhetoric, magnified by industrial assurances, might have the net effect of encouraging a society already dazzled by technology to be further assured that technology is solving the problem—people want so much to be assured—and so it's back to the television set.

Perhaps even worse than the fact that the ads are misleading or even lying in many instances, is the fact that they divert the reader from a more central understanding about what's really going on. That technological society is beginning to reach its limits, and expansionism is going to end, and endless consumption is going to end, and we're all of us going to begin adopting techniques of societies who live on islands and for whom a finite system is given.

The ads are even destroying the word "ecology" and perhaps all understanding of the concept with it.

A few weeks ago, P.G. & E. ran a headline advocating a "balance between ecology and energy."

But ecology is not a thing that is balanced against anything else. The word describes a science of the interrelatedness of everything. Energy is a detail which only man has decided to make a fuss over. That is what must be remembered and it is getting increasingly hard to do so with this immense outpouring of diversionary, false, and deadening information.

While industry is spending a billion dollars putting out this stuff, as nearly as I can determine, conservation organizations are spending roughly $200,000 to attempt to offset it and to accomplish other urgent educational messages concerning one issue or another. That is, roughly two hundredths of 1 percent of the industrial budget. That much money to educate people to what the industrial ads are leaving out, or saying falsely or to educate people so that they'll not be lulled into false security.

This is an educational struggle which is taking place right now, today, and without some kind of immense outpouring of counter-information from conservation groups, I am very much afraid that the ecology fad will be even shorter than anticipated. People will relax and think everything's all right. We will have lost their attention.

If you agree with me that there is an educational impact to advertising which is direct and immediate, and considering industry's behavior, critical, I would ask you to include provision in the bill to finance conservation organizations in their efforts to use advertising in the following three educational ways:

1. Fairness doctrine advertising. Friends of the Earth, in concert with other groups, has begun proceedings to apply the results of fairness doctrine case against cigarette advertising, to advertising of polluting industries. If we succeed, as I believe we will, all radio and television stations will be required to provide a conservation organization with time in which they may present a counter message to an ad.

If an automobile company runs a 1 minute spot advertising its new model, Friends of the Earth could indicate what the implications of the annual style change are. Or talk about the pollution from cars, or the raw material that went into building it, or the problem of disposing of it. And the roads needed to run it on.

When a Standard Oil ad appears for its F-310, calling it "the greatest automotive advance in history" we will be able to put it in perspective by showing that it represents only a 5-percent pollution improvement, leaving 95 percent to go.

And talking about oil spills. And so on.

But even with free air time, and free agency work—there are dozens of ad agencies willing to do it—still, hundreds of thousands of dollars are needed to actually film and produce such spots, and we don't have the money.

2. General educational advertising. As I stated earlier, with respect to the bill as written, the idea here is to speak of basic solutions and basic understanding of environmental problems. To speak of consumption patterns and life styles and waste. To create an understanding in the general public which could help make it less susceptible to glamour appeals, and to attempt to put out of fashion the importance of "newer, faster, bigger" and "more, more, more."

The attempt here would be to develop a real understanding of ecology; a basic acquaintance with the fact that man is just one small part of the natural system with no greater rights than any other growing thing in it, and no rights whatever to intrude in the natural order of things.

An understanding of what it means to live on an island. We would like to see industrial innovations considered guilty until proven innocent, instead of vice versa.

3. The third area of desperately needed advertising funds is the area of issue-oriented advertising.

When a timber supply act hits Congress or an Alaska pipeline lobby, someone has got to speak out for the wilderness that has no voice of its own, and if it is to succeed—as the anti-Grand Canyon dam campaign proved it could—for the Sierra Club—it must be done with the same modern tools used by industry to tell everyone everything is going to be all right.

Right now, any conservation organization which does take an ad runs the risk of having done to it what happened to the Sierra Club—losing its tax-deductible status. So, at the moment, even with money, organizations are effectivey prevented from stating an alternative point of view.

As I say these things, I am aware that all of my concerns, as voiced in the first half of this paper are equally or perhaps even more applicable to the administering of educational advertising funds. What if they went to an industrial foundation, for example, making things still worse.

Having said all this, I must also say I have extremely ambiguous feelings about whether or not fundamental educational messages could be employed in a federally financed ad program, or whether the only talk would be about litter and clean air.

Much of an effective program, after all, would be against the behavior of Government itself. I will have to live with that ambiguity, I suppose, and hope for the best.

I thought it worth bringing up in any event because any educational program that is not cognizant of advertising spending will be rowing against a very strong tide.

And, I do know that if conservation organizations had at their disposal just 1 percent of the money industry had for advertising its reassurances, I believe a large part of the country could be educated to understand the difference between ecological messages and what Tom Turner has called "ecopornography." And it could be done now.

Thank you.

I am sorry that I didn't cut as much as I had planned to, but I got all excited. [Laughter and applause.]

Mr. **Brademas.** That is all right.

Mr. **Mander.** But I read it faster.

Mr. **Brademas.** It was an excellent statement, Mr. Mander. Because Mr. Reid must go to Alcatraz, I believe we will let him ask his questions at this point.

Mr. **Reid.** Thank you, Mr. Mander, for a very thoughtful statement, for a very coherent summary of your view.

More seriously, I think what you just said made sense. There is no question but that the power companies put out ads urging people to buy more air conditioning and then come along and say that they can't provide the power without increasing the rates.

Then the phone company urges everybody to get three phones in their houses and then complains that the rates are inadequate for equipment to handle the phones.

I take it, your suggestion for advertising does make sense because some of the best pollutists are not necessarily the best conservationists.

I would ask you in advertising as to whether you have taken serious steps with your advertisers to urge them to follow your prescription, or whether you urged the local newspapers not to accept advertising because it does violence to the truth on environment?

Mr. **Mander.** Well, to answer the second part first, no, I haven't urged local newspapers or other local media not to, although Don Aitken spoke earlier and has begun an effort to do that.

Mr. **Reid.** How about the Association of Advertisers? Have they taken any steps——

Mr. **Mander.** No. I did make a speech to an Association of Industrial Advertisers on this subject at one point, in which I also mentioned that I though advertising is one of the industries that is going to have a rapidly declining growth rate for all the reasons that I have stated here and I expected these remarks to cause a lot of controversy.

Instead they didn't cause any at all. In fact, people were very bored by them as near as I could tell and there was no taking seriously at all, which discouraged me greatly.

On the other hand, on a more optimistic note, I have had in the last 3 months over 100 job applications from major executives and extremely talented radio-television production people in the advertising business, willing to take half salaries or one-third salaries, quit their jobs, which are in some cases very, very big jobs, and come to work if we did these ads, if there was the money to run them someplace, and there was a way of countering this campaign.

For that reason I proposed this idea to the Ford Foundation, of an advertising foundation which could deal with these kinds of subjects.

Mr. **Reid.** Well, I think your suggestions are excellent and I believe that newspapers have a responsibility to make sure that advertising is accurate in the same way that we tried to establish in the Federal Government Truth-in-Lending Act.

I hope that you will write explicitly to the newspapers throughout California and urge them to apply the tests that the best newspapers generally do—where the ad is demonstrably true and not deceptive.

I would appreciate receiving your letter and hearing from you. I would be appreciative of your response and I would enter this into the Congressional Record upon receiving them.

Mr. MANDER. I think I will do that and I think I can get a lot of advertising people to go along with that.

Mr. BRADEMAS. Mr. Reid, as some of you are unaware, is the former publisher of the *New York Herald Tribune*, the local journal. [Laughter].

I have several questions following your most interesting paper, Mr. Mander:

First of all, with respect to what Mr. Reid was just talking to you about, namely what are the advertisers in the country doing, is it really reasonable to expect—in spite of your observation that a number of advertising executives have suggested coming to work for you because of their awareness of your concern about the ecological issue—is it really reasonable to expect that the advertising executives of the land are going to, as it were, turn on their clients?

Why should they suddenly begin living as saints rather than sinners?

Mr. MANDER. Well, if it is reasonable to say that society is in a crisis situation and everyone is affected equally by what may be the eventual demise of the whole system, if that urgency could be conveyed to the advertising people, I would say it is reasonable to expect that they would react very well, because they are fairly intelligent.

Mr. BRADEMAS. It is not their intelligence, it's their character I am questioning.

Mr. MANDER. But in the present state of things, judging by my own bouncing off of the Industrial Advertisers Association, I am prepared to say it is not reasonable to expect much response in the matter.

I didn't get to answering the first part of Mr. Reid's remarks concerning what we are doing with our own clients. I started with the premise that it is possible to persuade your clients to face up to the facts and to turn them around and to get them to really deal with it as they actually perceive it themselves, personally.

I have had only moderate success with that, I will say. I would say we have one or two clients who are at present still engaged in polluting activities and despite threats of denouncing them publicly, resigning the account and such things as that which is what we inevitably will do, they haven't come around as well as I hoped and I find it discouraging.

I think it is a slow process and the more we can educate them personally, the better chance we have; but I am not as optimistic about that as I used to be.

Mr. BRADEMAS. Is there, for instance, any effort being made within the trade association of advertisers in the United States, that is advertising, public relations associations, is there any effort to study in a systematic way, the applications of the newly concerned about the environment for the advertising, public relations business in the United States?

In other words, have any of those trade associations put together special committees or study groups to look into this problem for each industry?

Mr. MANDER. Well, I would say that industry associations are certainly very, very concerned about this.

Mr. BRADEMAS. No, I mean the——

Mr. MANDER. The advertising associations themselves?

Mr. BRADEMAS. Yes.

Mr. MANDER. Besides general exhortations to get involved in public problems and the importance of advertising men being involved and sprucing up their image themselves, I would say, no, there hasn't been what I would call a serious recognition by the industry associations and there hasn't been any serious thought, that I have noticed, given to the possibilities that advertising, in fact, may be heading for serious trouble, although there have been a lot of individuals—as I have mentioned, an extraordinary number of individuals—concerned.

Basically, advertising has been tied to the notion of expanding economy and it is practically antithetical to advertising thinking to be considering the possibility of less.

Mr. BRADEMAS. You really touched in your last statement upon my point. I take seriously the concern of advertising men about the ecological crisis.

If I would find that at least they would be willing to get together and consider the development of a set of standards to which they, as advertising men, would be willing to commit themselves before they agree to undertake accounts for their clients and they would say, for instance, "We will not take on an account for a client who pollutes, who does not take into consideration the impact on the environment of their economic activities."

Now, I take it you are telling me that we are nowhere near that stage of adopting standards at this point?

Mr. MANDER. Yes. I would say we are nowhere near that.

Mr. BRADEMAS. I also was impressed by your statement which is, I take it, fundamental, fundamental to every thing that you said, that any educational program that is not cognizant of advertising spending would be rowing against a very strong tide; I think you are exactly right and I think moreover that your plea for the fairness doctrine being applied to industry, the concern about issue-oriented ads and, in particular, your plea that general education advertising help create a real understanding of what we mean by ecology, I think those are very well taken points, Mr. Mander, and I strongly applaud them indeed.

It is the last of those three that I think we had in mind when we wrote into the bill authorization for funds to be used in the preparation of materials for use by the mass media in getting across the concern about the environment.

Do you have any more specific suggestions on how that proposed section could be used?

Mr. MANDER. I took it by the phrase "mass media," that what was implied in that section of the bill was funds which you say a newspaper could use to investigate, to do investigative reporting or scientific reporting, of one kind or another.

What I am speaking about today is actual advertising, simply because I think the mental set of society in general, as you now have it, reads advertising in a somewhat different mood or frame of mind than it does investigative reporting.

They know that—it is going to be hard for me to articulate this, but I think in some ways they are more willing to accept things that are stated formally in an ad, especially by a so-called do-good organization, as being true and pertinent than, more and more, a greater glut of information in the news columns of which we have had a tremendous amount already.

So I did have in mind a thing, which I don't know is possible, or even achievable or practical, but what I did have in mind was actual funding for conservation organizations eager to take on the possibility of using advertising as an educational form.

Mr. **Brademas**. Thank you very much. Mr. Hansen.

Mr. **Hansen**. Thank you, Mr. Chairman. We appreciate your very provocative statement.

Mr. **Mander**. Thank you.

Mr. **Hansen**. In that I think it effectively brought some of these issues into sharp focus.

I think you have properly identified some desirable goals in an attempt to achieve kind of a balance that will at least give the average person some reasonable opportunities to make a value judgment on some of the issues.

I think it is fair to say that it is probably not likely that we are going to be prepared to allocate the kind of resources that you point out that are properly going to be necessary to achieve this kind of basic fairness.

So let me ask for your comment on another technique that I have not heard mentioned. This may be very revolutionary and it probably will bring the wrath down on many of us, but it seems to me it ought to be explored:

Do you think perhaps, in view of the enormous amounts that are being spent on the kind of advertising that you make reference to—and I see no end to it. The finger is pointed toward those contributing heavily toward pollution. I think we are going to see a stepped-up advertising effort to clean up the image. Do you think now is a good time, perhaps, to examine our tax laws for the purpose of determining some new limitations on the scope of corporate advertising that could qualify as a legitimate business deduction?

Mr. **Mander**. I think that would be splendid. That is a revolutionary suggestion, one that I subscribe to.

Yes. I think if there could be controls over—I mean if there was some effective way of preventing industry by way of taxing, taxing an advertising budget over a certain amount, let's say, or providing an ombudsman who could tax advertising which is questionable or has the effect of presenting a point of view in society for which it doesn't have an opportunity to defend itself, that we might make the whole competition between the ecology message and the advertising-public relations effort to soften it a much more equal effort.

But there is a very immediate kind of tax problem, and I did make a very brief reference in my statement—but not as part of the prepared text—which is that we still have the situation whereby conservation organizations, in fact any other tax deductible organization is effectively prevented from doing this work, which is far more shocking to me than the fact that an industry can present its message.

Industry can present its message and write it off as a business expense, but the Sierra Club or Friends of the Earth or any other conservation organization which wishes to oppose some project seriously, if it involves legislation in any way at all, runs the very serious risk of finding itself out of business because we may be violating the IRS conditions against tax-deductible organizations spending a lot of money on influencing legislation.

So industry can find it easy to be lobbying or influencing legislation, whereas organizations which are only set up for the public good and have no motive or desire to make a gain out of it, are effectively and very definitely prevented from doing it.

The Sierra Club was seriously hampered by that action and Friends of the Earth, which was formed as an activist conservation organization sets itself up without a tax deduction deliberately so that it could take on public questions but, as a result, it prevented a tremendous amount of donation money from coming in so that in a way the organizations acting in the public interest have two strikes against them as they start, because the fact that they don't have any money to do the message bit.

So I would—I agree entirely with your suggestion. I think I would like to study that, in fact, and maybe even propose some possible solution to what you are outlining.

If industry would be prevented from writing as a deduction, if P.G. & E. could not write as an advertising deduction its ads trying to sell the public on nuclear power as a nonpolluting power source, it might not do quite so many and it might be easier to have an equal argument about the merits of the issue as it actually is.

Actually, you know, industries—this is another point—are encouraged to spend money whereby most will allow advertising expenditures to be included in the total amount of money, in the total cost of operation which an industry then may apply a percentage to, to increase its profits. So in effect you spend more money on advertising and you get greater profit, not less profit.

Mr. Hansen. Thank you very much.

Mr. Brademas. Mr. Mander, I just have one other question, and that is—I was struck in your testimony by several references to what I took to be in your own mind an earlier happier time when people lived in the forests and simple subsistence economies on the Micronesian Islands or Alaska in igloos, and I have just two question here:

One is, while I am sympathetic to your suggestion that we ought to consider in systematic ways the impact on the environment of various forms of intervention—and one witness suggested that we might set up ecological models by using an island—and others suggested that you could harness a computer in which you could put in variables and then you could make an intelligent judgment of what would be the impact ecologically on a variety of forms of intervention, but I am only expressing the hope that you are not suggesting that it is really possible for us to return to some state of nature where there is joyous dancing in the wheat fields and progressive kindergartens. Although that would be very pleasant, is that really possible at this stage of the game?

You understand the thrust of my question I take it?

Mr. **Mander**. No. I think it is not possible under the conditions at the moment. I myself am not a Luddite although what I am interested in doing is making sure the Luddites have a say, simply because there is tremendous truth in the fact that there are other levels of satisfaction in the world beyond acquisition of material wealth and continuing devotion to economic and technological growth—but I am also interested in articulating, in an as extreme way as possible, simply because it doesn't get articulated often enough—the notion that growth and technological development and absolute commitment to technology as a solution of problems is simply an inaccurate way of proceeding.

There may be a technological solution to one problem or another—I know Stewart Brand, I think, will have to say something about that—but I think it can be established that growth as a panacea, growth in an economic society, based on economic growth as something of an absolute God-given organic process that people need to respond to—is nonsense, in my judment, is not at all required.

As we see by looking at others, the Micronesian Islanders whom I spent some time with, I find their lives extremely satisfying, and the notion of expansion and growth is literally meaningless and of no importance.

So I am mainly interested in undermining the commitment to growth as any kind of a reasonable goal at all.

Mr. **Brademas**. Well, I appreciate that. I thoroughly agree with you. I think I am right in saying that it was the distinguished scientist from California, Dr. Murray Gellman, who won the Nobel Prize a few months ago, who said something to the effect that the mark of a truly civilized society is its capacity to forego undertaking enterprises of which it is technologically capable. [Applause.]

Mr. **Mander**. Like the SST. I think the phrase is "guilty until proven innocent."

Mr. **Brademas**. Well, thank you very much for coming, sir, and I hope you will let us be in touch with you further.

Mr. **Mander**. By all means.

Mr. **Brademas**. Our final witness in our morning session is Mr. Stewart Brand who edits and publishes the *Whole Earth Catalog*.

Now, Mr. Brand, we are glad to see you. We are aware of your catalog. We read about you in the powerful *New York Times* and we are glad to welcome you.

STATEMENT OF STEWART BRAND, ECOLOGY STUDENT

Mr. **Brand**. My statement is brief. I am delighted by the spirit behind your Environmental Quality Education Act, H.R. 14753, and depressed by every measure in it.

I am a former ecology student and I can report that ecology as a science is pretty boring. Definitely not for everyone.

Ecology as a movement, as a religion, is tremendously exciting and everyone can get a piece of the fervor. However, this voluntary mass education could be poisoned by Federal help, as highly-intentioned, overspecialized application of fertilizers and pesticides has damaged other natural growth processes.

In my experience the whole apparatus of application, approval, and funding commonly introduces a dishonesty into an operation that can never be eradicated; and if the operation is educational, dishonesty is the death of it.

I see that the bill provides for preparing information specifically for mass media use. Involvement of government with mass communications in this manner strikes me as dangerous as rejoining church and state.

If Federal funds are to be spent on environmental matters, let them go to:

1. The space program, which has given us the antienvironmental perspective to see our planet whole and alive and in hazard.
2. The World Game of Buckminster Fuller's. This computer operation is planned to perform for the earth as NASA computers did for Apollo 13. Inventory resources, assess damage, compare alternative futures, select the most promising, constantly.
3. Contingency planning for environmental disasters comparable to long-range planning in the military.
4. A wet NASA to investigate the sea and treat it like Antarctica, as a fragile, transnational environment. Use of the oceans must be governed from a strictly environmental standpoint by an international body with a great deal more power to act than the U.N. has.
5. Rehabilitation for ecological disaster areas such as Lake Erie and the Appalachian strip mine country.
6. Ecology action-type groups, but only for services rendered. Do not fund them, do not tax them, do not pass laws about them. When they perform a service to government such as investigation of environmental crimes, pay them for the information.
7. Follow-up reports by independent groups of Federal actions affecting the environment. Do this as a built-in part of initial funding. Appropriations for a dam or a war would include money to go to the National Science Foundation or the Audubon Society or whoever, to study the environmental effects of the project and report on them.

I realize that practically none of the above are the province of the Education Subcommittee. John Holt has suggested that if we tried to teach infants to talk, they would never learn. I suspect it is the same with ecology. It must be learned—it is being learned. If you try to teach it to people you will only teach them to hate it. Let it be. [Applause.]

Mr. Brademas. Thank you very much. I am delighted by the spirit behind your testimony and depressed by every sentence in it. [Laughter.]

Because, if I read you right, you really want to leave things to industry to pollute and I don't think that is really what you had in mind.

For example, you say that you don't want the Government involved with mass communications and in the manner which this bill might make possible; namely, the kind of assistance for preparation of materials about which assistance Mr. Mander testified before you.

Now, if one were to take that superduper free enterprise attitude which your testimony suggests, you would leave the mass media in this country still more under the powerful economic control of the industries that pollute.

I would remind you that it is only because of the imposition of the fairness doctrine by the Federal Communications Commission that we now find some spot commercial on television in this country that attack cigarette smoking as being injurious to health, whereas prior to that the cigarette manufacturers had a complete monopoly.

Now, I cite this only as one instance in which, I think, your readily colorful rhetoric is dangerous. You don't really mean that, do you? Do you understand my point?

Mr. Brand. I believe so and I am not sure that the fairness doctrine hurts the right guy.

By insisting that networks, for example, give equal time to, you know, the other ads, we will say, who gets hurt is most directly the networks because they are the guys who lose some of their time.

Mr. Brademas. That doesn't upset you, does it?

Mr. Brand. I don't know. This whole question of the relationship of communication system and government is the hottest one going. This will be going for years.

Mr. Brademas. I am not quarreling with you about that, but I am trying to pin you down as to your implications on your contention that, I take, you are saying—just let the networks and manufacturers and advertising agencies have control of the whole shebang; who is speaking up for the public interest?

Mr. Brand. Well, the public can speak for itself.

Mr. Brademas. Who speaks up for the public interest?

Mr. Brand. Well, you see, I am just trying to be as useful a witness as I can—the first operational experience that I have had, I learned a lot of stuff in the schools and then had to go to unlearn it and relearn it my way so that I can feel good with it.

That's happened with ecology, it has happened in other things. The other operational experience I have had is that all too often Federal funds have come in as kind of a poison from—on high or afar—into the local operation where they don't bear real relation to the local situation. And this dishonesty bit, boy, you lose every time.

Jerry's point on the taxation question is a good one. The first one to apply for exemption would be the big companies with the pollution ads.

Mr. Brademas. Well, I hear what you are saying and I don't think that I am in disagreement with the spirit that motivates you, but I think—and we are just, each of us, expressing our own judgment here—that the implications of your statement, if taken seriously, I think just may distress you to hear me say that this would be welcomed with open arms by the polluting industry.

You don't want any form—I take it from your statement here—you don't want to have the Federal Government to either through the FCC in the case that we have been talking about, or through encouraging education about the whole spectrum of environmental issues, to be involved.

Now, we have had witnesses testify here this morning—you have heard them—warning and showing instances on how a polluting industry won't hesitate for a minute to put millions, hundreds of millions of dollars into advertising to get its point of view across and to suggest that the polluting industry is doing a splendid job of coping with pollution.

Now, the purpose of the legislation we are considering is at least to be able, in a modest way, to begin educating people about some of the dangers of pollution and other attacks upon the environment. So I am not quite sure that I appreciate the thrust of your testimony.

You suggest here that you would like to see some contingency planning for environmental disaster—I think that is a splendid idea—but how do you think you are going to get any support in this country for measures of contingency planning for environmental disasters unless you get people to understand that the environment is in danger of disaster?

Do you understand what I am getting at?

Mr. Brand. Yes. I am making two assumptions, one, that legislating honesty is often counterproductive.

Mr. Brademas. I have no quarrel with that assumption.

Mr. Brand. And the other is a technological assumption, perhaps, that the communication environment for honesty is improving. People are good at catching a lie and telling each other about it more than ever before. It's our lagtime shortening. Our communication is coming so fast that people catch on fast and all it takes is one guy saying, "Hey, that guy is lying," and a couple of other guys will get up and say, "Yes; here is the evidence," and whatever you spend on your ads is wasted.

Mr. Brademas. You really believe that?

Mr. Brand. Sure.

Mr. Brademas. I don't believe that for a minute. You should see the advertisements that were running on Earth Day—full-page ads by a beer company saying "Beer is good for you and drop the can in the nearest wastebasket on the beach."

If your analysis were accurate, we would not be faced with the enormous assault on the quality of environment of today.

The fact of the matter is, it seems to me that we see pollution everywhere we turn and people are not telling each other about it.

Mr. Brand. I will say one thing completely in support of what you are saying and probably of the bill, that kids are catching their folks on littering, stuff like that, and as near as I can tell it is coming straight from what they are getting from the ads on litter; and they can hear, the kids can hear, and this indeed, I think, is the important audience for information.

So, to that extent I am with you.

Mr. Brademas. Well, I hope very much that one of the suggestions that you touch on here will win some support in Congress; namely, if I read you right, that we ought to begin far more seriously than we do to consider the ecological implications of the proposition, as you suggest, for a dam, and it is really extraordinary that it is only, I think, within the last few weeks that the U.S. Army Corps of Engineers finally decided that they had to consider some of the environmental implications of some of these dams and other public works projects.

So I take it, Mr. Brand, it is that kind of effort that is at least modestly——

Mr. **Brand.** I am curious, is there precedent for this kind of work in any laws or any programs that have been started up like that?

Mr. **Brademas.** Well, there is one that I have just mentioned to Mr. Hansen. I think I am right in saying that the Environmental Quality Council legislation that established that, which is presently chaired by Russell Train, has built into it the requirement that the impact on the environment of certain funded projects has to be taken into account before those projects can go ahead.

It is that particular kind of law that is presently in the newspaper—even this week—with respect to this proposed pipeline up in Alaska of which, if it is allowed to go under the snow, could have a very adverse effect on the ecology of that entire area.

So at least there is something on the statute books now. I don't think there are enough teeth in the act at all to suit me, but I think we are moving in the direction in which, I take it, is the spirit that is behind your statement.

Mr. **Brand.** Has there been anything in the testimony or have you heard of any suggestions of what would amount to not computerized knowledge but environmental tests on a smaller scale than that proposed?

For example, this could be done, some local tests of the kind of things to see what happens and you should be able to get information back within 6 months or a year, at least, and know what they are up against; you can see that in a few acres presumably, not doing the whole thing all at once.

Mr. **Brademas.** Yes. I think some such effort in a modest way is going on mostly by natural scientists.

Well, as an owner or purchaser of your catalog, Mr. Brand, I want to again thank you for your statement and if my questions seem rather stiff, it is only because I was trying to elicit from you some further expressions on this issue and I think our spirit is similar on this matter. Mr. Hansen.

Mr. **Hansen.** Thank you, Mr. Chairman. I would say that, as I read your statement, I find a great deal that I can agree with and my disagreement would be to the emphasis. I do find in the proposal that you made some federally funded educational effort and this encourages me.

I do think that you have properly focused on the need to rehabilitate the ecological disasters of which we have many around the country, but where I would perhaps disagree on the emphasis is on my very strong feeling as a cosponsor of this bill that we need to prevent the future ecological disasters and the best way we can do that is to create the kind of public awareness in which people can make a reasonable judgment on the values that are involved so that we don't destroy another life, we don't destroy the countryside with strip mining or carry out some of the activities that have left scars on the landscape.

My only question to you would be, What do you think the Federal

Government can do to help create the kind of basic knowledge and understanding that we have to have in order to avoid the mistakes we have made in the past?

Mr. **Brand**. Of course, the main thing I am saying in the statement is not to do an aggressive teaching thing around ecology, possibly a more passive thing on the order of involvement of libraries, making materials available much more widely and the better materials that are coming up fast.

You see, I figure in about 5 years from now this whole thing, this whole ecology information will be pretty much routine. We've got a few years left in creative searching.

I don't see the present effects of this bill of being much use in creative searching, creativity is always coming from outlaws, from one kind or another of guys that just up and start doing it. If they don't have any money they do it for free.

The thing they need is things not to be in their way. When I worked at a college recently, I spent all my time defending the space in which I might do something, and never got around to doing the something. That is what tends to happen, particularly around this kind of activity. I think the thing to look for would be the inventions that would have side effects to get what you want going.

Much of that image of the earth has transformed humanity. It is completely—it's the engine of the ecology movement as far as I can recall.

Well, the space program, I can assure you, didn't have the slightest idea that that was going to occur. They spent 10 years in space before they turned the cameras around to even photograph the earth, but it could have been anticipated. You can expect things to come out on the side and you can support programs, therefore, that affect awareness in this way.

For example, the Alcatraz Indians, whether or not they actually get the island, whether or not they actually get a college going there, of materials, just the fact that they have had it is doing so much for people's awareness.

If they have a college it may be incredible and indeed the Federal Government is involved in that.

Mr. **Brademas**. Would the gentleman yield?

Mr. **Hansen**. Yes.

Mr. **Brademas**. I can't let that go by, Mr. Brand, because once again I have to say in all candor, I think you are going to beguile a lot of people down the wrong path from my perspective if you tell them that NASA is good for them.

Mr. **Brand**. NASA doesn't know it's good for them. Their intentions were nowhere, but the effects were good.

Mr. **Brademas**. Have you ever thought of the costs of getting those effects? Last year the House of Representatives passed a $3.6 billion I believe it was, authorizing expenditures for the Space Administration. I voted against it.

Now, if you tell me that I have to vote for nearly $4 billion in authorization for the space program in order to get the useful image of spaceship earth, I cannot believe that you mean that to be taken credibly.

That's like saying that the Vietnam war is good for you because you learn a lot about how you treat tropical disease. I don't understand that kind of reasoning.

Mr. **Brand**. Well, education comes through mistakes, through disasters and conflicts. It's come right through. Who else besides NASA—talk about luddites—every now and then, they destroy a machine, a big, beautiful machine and it's got a real—I think—a beneficial quality to it.

The thing is that every so often you take a thing that you revere and you destroy it and make a new one, maybe better, maybe forget about it. They are getting as close to the center of consciousness and ambition as anybody, and all that and they are making gorgeous mistakes.

Mr. **Brademas**. Well, we are spending or would spend under this administration in this Congress as much money for the space program or almost as much money for the space program, almost as much money for the space program as for all forms of support for higher education in the United States combined.

Now, your system of priorities, your system of values may say "That's all right." But I just cannot take you seriously that what you are saying at that point is true.

I appreciate the thrust of your concern, but in all candor, that is good news for the polluting industry if we would follow your line of reasoning here.

I hate to say this, but in my judgment—well, I have interrupted the gentleman longer than necessary; too long. I was really quite shocked to hear you give the endorsement of the space program, because it produced some modest side effects.

Mr. **Hansen**. I would only ask whether this same judgment applied to the SST, the ecological advances it may have achieved through the development of the supersonic transport.

Mr. **Brand**. I don't have the knowledge about the SST. I know about all the opinions, but I don't know anything about its usefulness or its cost or what it is going to do. It doesn't strike me as anything but sort of an obvious next step—and who needs obvious next steps?

Mr. **Hansen**. Thank you. Thank you, Mr. Chairman.

Mr. **Brademas**. Thank you, Mr. Brand. I agree with your vibrations but not with your prescriptions.

We are very grateful to you. [Applause.]

We are very grateful to Mr. Brand and to all of our other witnesses this morning and we are going to adjourn now for a little over an hour before we return around 2:30 for the student-faculty panel. The subcommittee is adjourned.

(The hearing adjourned at 1:30 to be resumed at 2:30 p.m.)

AFTERNOON SESSION—2:30 P.M.

Mr. **Brademas**. The subcommittee will resume consideration of H.R. 14753 this afternoon.

We shall have a panel discussion of the witnesses who have been scheduled, Dr. Arnold Schultz, professor of forestry and conservation, University of California in Berkeley; Dr. Michael Scriven, professor of philosophy at the same university; James Pepper, a graduate student at the department of landscape architecture, and Ruth Corwin, an undergraduate student also of Berkeley.

The Chair would like to suggest that these witnesses be kind enough to come forward and take seats and that, if each of them will be good enough to summarize his prepared statement—the entire text of the prepared statements will be inserted as if read in the hearings—and that procedure, I think, will afford us more opportunity to put questions to you. Unless there is some other order of testimony, we can begin with Dr. Schultz.

Who is Dr. Schultz—you, sir.

Then, I take it Dr. Scriven is not yet here?

Dr. **Schultz.** No.

Mr. **Brademas.** Mr. Pepper?

Mr. **Pepper.** Yes.

Mr. **Brademas.** And Miss Corwin?

Mr. **Corwin.** Yes.

Mr. **Brademas.** Would that be satisfactory?

Dr. **Schultz.** Very good.

Mr. **Brademas.** Dr. Schultz, if you would go ahead, sir, and, as I suggested, if you could summarize for us your statement because we have your statement and we can read it as you move along.

Dr. **Schultz.** Very good. Thank you, Mr. Chairman.

STATEMENT OF ARNOLD SCHULTZ, PROFESSOR OF FORESTRY

Dr. **Schultz.** I am an ecologist. I have been a practicing ecologist—teaching, research and consulting—for 30 years. Some of my later remarks will reflect this background. I think Mr. Brand, who talked about being bored by ecology didn't, of course, take a course from me. [Laughter.]

I have a bachelor's degree in zoology from the University of Minnesota and a master of science degree in ecology, also from Minnesota, and my Ph. D. was in plant ecology from the University of Nebraska.

The advance degrees at that time—some 30 years ago, 25 years ago—were taken under the two leading ecologists in America at the time—W. S. Cooper at Minnesota and J. E. Weaver at Nebraska.

I came to Berkeley in 1949 and at that time my title was "specialist" but I already felt I was a generalist.

My research has been on both sides of the environmental quality issue. In the early years I studied fire and chemical, biological and mechanical methods of manipulating vegetation. Since 1958 I have been studying entire ecosystems—the arctic tundra, the coastal pygmy forest and high mountain meadows.

Now, not to continue on with more of my qualifications but rather to indicate some of the things that we have already started at Berkeley in the way of environmental quality education, one of these things that I have been involved in since 1964, I have taught a course—a graduate level course—which is called natural resource ecosystem, but I prefer to call it ecosystemology. And this was the first course of its kind in the United States.

Now, one of the students that took my first class was Garrett DeBell and I have perhaps the first handbook, *The Environmental Handbook*, that came off the press. The handbook was edited by Garrett and this booklet was sent to him by the publisher wherein he inscribed his statement with something like this on the flyleaf:

With compliments to Arnold Schultz who first turned me on to ecological generalities.

In 1969, just this last fall, I initiated and taught another new course, this time for undergraduates. This is the popular interdepartmental study course entitled "Man and His Environment—Crises and Conflicts."

It has had up to 525 students per quarter, from freshmen to graduates, and represented by nearly every discipline on campus.

There have been a number of developments in the past in getting a curriculum started on an interdisciplinary basis. I have that in my statement there, too, and I will not go into it in any further detail.

Now, I would like to make some brief comments on the bill. If this bill passed, it will serve an excellent purpose.

However, as it is now written, I see a number of weak emphases and fuzzy thoughts which, if not modified, may ultimately get the whole program off on the wrong foot.

I shall outline these here and the rest of my statement will discuss each of the points in some detail. In no case do I offer new phrasing for any part of the bill.

Compared to this morning's testimony, I am addressing myself to a very narrow part of what the bill is concerned with. I am thinking primarily of formulations, a way to put ideas and philosophies across and for continuing education, not just the immediate time.

For the first point there needs to be greater emphasis on understanding and accepting the role of management and control which otherwise cannot stand up against such nice words like "preserving" and "enhancing."

The big umbrella word "environment," admittedly now impressed deeply on everyone's mind, is part of today's language, but it is a wholly unworkable concept for studying and solving problems.

In other words, we have to redefine or reconceptualize the word "environment" from the way it is now used in common parlance.

Should the bill say anything about purpose or goals? The earth may well be in its present mess because teleology has been carefully and deliberately removed and extracted from science curriculums.

I think this is a very important point. We have eliminated the question "what for" from science and this was started in the days—since the days of Descartes and Newton.

For preserving environment and maintaining ecological balance are textbookish cliches. They may be objectives that should not at all be sought in a dynamic world.

How well can our present academic establishment carry out the progress envisaged in this act? The number of fired up and sincerely concerned teachers is perhaps large enough. But the cadre of faculty equipped philosophically to do the job right is pitifully small.

Are the education programs to be established as a result of this bill simply to be added on to the existing school curriculum? To me it looks like it will take something more like a sweeping reform, at least modification, of the whole education structure.

So let me speak just briefly to each of these points. First of all, the focus on management.

To achieve or maintain any desired quality of environment, control or regulation must be effected. This requires knowledge about management. But environment itself cannot be managed, only systems can be managed—in this case the ecosystem.

The idea is that "environment" is too vague a term and one reason why environmental quality has deteriorated in the last half century is that the science which deals with environment—namely ecology—has traditionally abhorred the idea of management; however, if you think about it, any time you take some overt action to correct something or to do something, it is management, and the ecologists and the "balance of nature" people in the past and even Earth Day people of the present think in terms of "leave it alone," but we know now that we just cannot leave it alone.

In fact, to leave it alone is a form of management—if we think in terms of management—no matter how objectionable the term may be to us. I think this would be at least pedagogically preferable to a term "environment" with now is a vague term.

I put the ecologists' word or term "balance of nature" in the same category as the economist's "free competitive market." The physicist has an analogous construct which sums them all up perfectly:

"The perfect gas." [Laughter.]

Today's rhetoric perpetuates the notion of "environment" as an ideal, which because of man's activity is becoming less and less so. I think it better to consider environment the other way around—as a constraint to man's activity.

Now, I am not suggesting that the words be changed in the bill to accommodate this philsophy. I realize that environment and ecological balance are now ordinary concepts, useful for conveying the general concern. But as scientific or managerial concepts around which to develop sound education programs they are horribly deficient and completely inappropriate.

Now, as to environment, my reason for defining environment as a constraint rather than something that should be managed or controlled or something that is out there deteriorating because of man's activity—everything from the skin on out is environment, from man's skin on out is environment. This is all environment and the farthest reaches of the universe cannot possibly be controlled. We can't do anything about it, in fact, we don't want to—we don't worry about it, but there is some point between man's skin and a distance from there that we think in terms of "our system," "our ecosystem" or home or whatever you want to call it—our immediate environment we call it—and this is what needs to be managed, this is what we are concerned about and all that we have outside of that at that boundary is what truly should be called environment. This is something that we do not need to control.

So that part that is measured right at the certain boundary of a system is actually a constraint, or a given, a fixed constraint under which we have to act and this is about the only feasible way I know of how to handle the problem and to formulate it into a framework which can be put across at any level.

I haven't tried it at the elementary level, but I think perhaps it can be done there, too.

So this puts more emphasis on ecosystem itself than on environment. Some of the testimony this morning also brought in that same concept of the ecosystem.

The greatest advantage in packing conceptually all the manipulable things into the ecosystem is this:

Now all the tools and strategies of systems analysis can be brought into play. Such methods as simulation, operations research, decision and game theory, network and flow theory, topology and others are powerful and have found application in many fields—it found application in business administration, economics, architecture, and elsewhere. So these methods are likewise appropriate for studying and managing ecosystems.

A system is an organization with a purpose. This relates the system to some larger system—the ecosystem we are talking about—and it should be recognized that the earth is polluted as it is because science and technology were obsessed with mechanisms, finding out why things happened, without a thought of goals.

The "what for" questions were not deemed worthy of science and the schools perpetuated the blunder.

So in all our sciences we have been thinking in terms of mechanisms, what makes things tick and we haven't ever asked the question of what for which has always been relegated to poets and philosophers.

So the philosophy of holism, along with system study, both synthesis and analysis, are necessary components of the educational programs that ought to be envisaged by this bill.

Now, another thing that bothered me is the way environment and science and nature is thought of.

Nature to me is what exists right now. It includes the oil rig platforms in Santa Barbara Channel, the Delta-Mendota Canal and Lake Erie in its present splendor. The strategy of natural science is mostly analysis, its output is descriptive and it records invariance among all observed events and states them as natural laws.

It doesn't make any difference, really, whether the agent, the active agent initiating a process is the wind, which we can't do anything about, or if it is man who does something by accident or man who does something by willful design and so what exists now is nature; otherwise we get into trouble to figure out how far back we have to go before we even can find nature.

Artificial science is concerned with what ought to be. Goals and purposes are involved. The strategy of the artificial sciences is mostly synthesis. Synthesis is involved in design, management, policy formulation, in creative work, and in all decisionmaking. Artificial sciences include engineering, law, architecture, business administration, education. I think of ecosystem management as an artificial science. I think of ecosystem management as a profession which we must develop.

So ecology is a natural science to the extent that it describes the system as it is under the constraints of all natural laws. But no one, least of all the ecologist, is satisfied with the world as it is. It must be changed to something else—to what existed in earlier times, to tolerable limits, to a more conservative use and so on.

Even when we are satisfied with the present state, we choose to apply some overt action to keep it that way and this is management—anyway you want to slice it—this is an artificial science.

So I think we have a hangup here on this distinction between artificial and natural sciences in the way we teach ecology, in the way we teach environmental sciences, whatever you want to call it.

Now I want to say a word about multi versus inter versus intradisciplinary studies.

The word "interdisciplinary" is sort of an in-thing in education today and there are several ways in which this can be brought about.

One way would be—this is in education now, I am not talking about interdisciplinary research—in practice this means to get people from various disciplines together to teach their particular bag of ideas to the same student. Professors sometimes get together the idea beforehand and bring these ideas from the separate specialties into an integrated package and subject the student to it.

More often they individually toss the specialty concepts up into the air, and as they come down, the student grabs an armfull of confetti and does the integrating himself.

This is not a caricature. This is the way, the only way we can think at present about the interdisciplinary approach. It takes a new language common to all disciplines before the real goal is effected. The real goal is the production of a multidisciplinarian, a person who can handle competently more than one discipline.

Now, this brings up the argument about the generalist and the specialist. There would be no argument except that we go to school with the aspirations of becoming specialists. I think it has been with us for centuries.

The question every grade school or high school student asks himself at some time is "What do I want to be?" If he turns out to be a generalist, this is simply because he could not make up his mind about what course to pursue. Our educated society has built up a stigma against this. Employers, while they like people who know something about everything nevertheless use expertise as a criterion for hiring.

So even environmental quality education must take these matters into account. Obviously we need some generalists. At elementary and high school levels, students have not yet put the blinders on. So unlearning does not have to be done. The problem really is:

First, in training the teachers who are in charge of the school programs and, one step further back, in training the organizers of the teacher-training programs.

At step two is where we desperately need multidisciplinarians, people with a holistic philosophy who are not convinced that all can be solved with technology nor convinced that all can be solved with political action.

Specialists are for the most part too hungup with intradiscipline loyalties, too immersed in their own language, too narrow in their outlook to be helpful in organizing a training program. This is evidenced by the difficulties we have at Berkeley in developing a broadgaged graduate program.

So my conclusion is that we have really very few people who at the outset can put such a program together or can properly evaluate project proposals—and in connection with the point that Dr. Aitken made this morning that the idea of specialists specializing or making a single discipline out of environmental science is folly, I have a little different way of looking at that.

I think that we can turn out specialists in generalizations; in other words, people who do generalize but specialize in it; in other words, they are trained to generalize rather than just happen to take a potpourri of courses and become generalists.

Then there is one final point that I want to make and that is the relationship of the environmental quality education to other curricula.

As I said in my premilinary remarks, there is a possibility that this, the education program resulting from this bill, might be just thought of as being added on or stuck into the school curriculum, but I think it has to go further than that, mainly because I visualize that the generalists' training will have to leave out some things.

For example, a student wants to be a biologist. At present he has to take chemistry before he can become a biologist; maybe he has to take some physics before he can take a course in chemistry.

This is the building-block method, where you have to take some of the things at the lower level of organization before you can understand those above. I think this is wrong.

It seems to me that what we should do is start at the perceptive level, simply what objects and relations we apprehend.

Then if we need an explanation, that is, if we are interested in mechanisms—that is, if we are interested in mechanisms or inward-directed phenomena—we can take the time to drop down one level and go to chemistry or to physics, if necessary, or to nuclear particles, but we should go down no further than is necessary to give the explanation we want.

This gives more time for studying outward-directed relationships from biological subsystems to the political and economic and social subactivities.

So it is conceivable that a thorough education program addressed to environmental quality could alter some basic precepts such as the building block one. I would prefer to say "should" rather than "could."

Another thing that would be affected is rigor. There are two opposing views. We can't really have a good outgoing generalist program without sacrificing some of the rigor. I don't know whether you need to worry too much about rigor or put too much emphasis on it, but the two things don't go together too well; however, it may be formulated at a certain level of organization and we can talk about this with suitable rigor. I think that sums it up pretty well.

Mr. **Brademas**. Thank you very much, Dr. Schultz.

I think we will next call on Mr. Pepper and put the questions to all of you together.

STATEMENT OF JAMES PEPPER, GRADUATE STUDENT

Mr. **Pepper**. I see the problem as who should educate whom regarding what. I think the first half of my paper, which addresses the source of the problem, is vital to how we go about answering it. I will try to summarize, as briefly as I can, the points contained in this portion of my paper.

The first point that I feel must be straightened out relates to who is to blame: who is to really be educated regarding inadequacies that have brought about the so-called environmental crisis.

I notice today that legislation and governmental and industrial publications address the public as being the guilty party. I believe this is the height of hypocrisy, and that along with addressing the public, the leadership of both government and industry must assume their responsibility. I should even hope that this could appear in the legislation specifically, because leadership is certainly a major part of the problem.

My second point addresses environmental legislation. For the past decade I have become familiar with the legislation that has been proposed regarding ecological inventories, environmental management, and general environmental matters; they have all been defeated, which to me means that the Congress itself is sorely in need of education.

This problem is not a new one. This has been questioned since the twenties. As I recall, at the UNESCO conference in San Francisco last December, LaMont Cole, an ecologist, produced a document that originated with the Ford Motor Co. in the twenties saying that they would not market a pollution-free internal combustion engine until government made them.

As far as I am concerned there are two guilty parties—government and corporate leadership.

Lynton Caldwell, a professor of government from Congressman Brademas' home State, prepared an excellent paper for that UNESCO conference, addressing the subject of governmental organizational adequacy for managing the environment. I trust that this is environmental education.

Environmental problems are not the result of malfunction of natural ecosystem, but are the impact of the limited objectives of our own social, economic, and political policies. Environmental education is not a simple matter. It not only requires a functional knowledge of natural and social systems, but also the very difficult and emotionally charged area of intentional cultural change. To be effective in this area will not be easy, but this, too, is environmental education.

Now, I believe this has been the one point which has been overlooked in the testimony that I heard this morning, and that is, that it is the people that are going to have to change the cultural system. The natural system continues "doing its own thing."

If we are not prepared to accept the challenge to assure a qualitative future for our species we are sorely missing the boat.

To develop a theme of Professor Schultz a little further, environment is everything that is outside or external to the organism or object of study. Education directed at this phenomenon would necessarily be holistic, or all encompassing in its subject matter.

This presents a dichotomy in the present form of education. This holistic education cannot be taught using the techniques of the present specialists or compartmentalists and by that very nature, our present education is unintentionally antienvironmental. Adding new curriculums is not the solution. I am sure that a total revolution in education, and nothing less, will be required to achieve environmental quality.

Now let me address my remarks specifically to the provisions of your legislation. I will read from this point on and make your job, Mr. Reporter, a little easier.

I am a proponent of environmental education and endorse the legislation in question, but with both general and specific criticism. Much of this bill is vague—perhaps legislative language has this characteristic, but for an informed public the bill is simply too unspecific. In some respects it is also misleading.

Frequent use is made of the phrase:

> . . . to establish educational programs to encourage understanding of policies and support of activities designed to enhance environmental quality and maintain ecological balance.

Even if the terms "environment" and "ecology" have serious limitations for any functional policy, it will undoubtedly have to suffice for want of more appropriate and accepted terms. Perhaps Dr. Schultz's ecosystamology is the concept to discuss.

Now to specific criticism:

My first specific criticism of the provisions concerns the description of eligible grantees as set forth in section 3, item 1. The description reads as follows:

> Institutes of higher education and other public or private agencies, institutions or organizations.

Now, this appears to me to exclude no one. In order to avoid pork barreling, this bill must limit grants to specific areas of endeavor. I favor grant-funding priorities be given to persons and organizations who have previously been involved in the commitment to interdisciplinary study and research and to people who presently have a commitment to meaningful environmental education.

And a word of caution: Large research organizations and major educational institutions will find it hard to resist the temptation of "environmentaling up old research proposals with the addition of a social scientist or 'environmental somethingist.' "

I think this is imperative that this is understood and that, if the legislation is passed, the grant selection committee must be aware of this.

Furthermore, these institutions absorb capital all too easily. I understand that you undoubtedly will have limited capital to begin with and I would suggest places that could generate programs rather than be swallowed in ratholes of present research funding.

Therefore, I propose that grants should favor student and citizen-initiated projects and elementary and secondary education programs which are multidisciplinary and problem solving in structure.

I think the insertion of "problem solving" is imperative someplace within the legislation so we are no longer addressing ourselves to some abstract but some operational-functional concept that Dr. Schultz has alluded to.

Special attention should be given to interdisciplinary Ph. D. students who will provide us with sorely needed environmental generalists or managers.

I would like to add another comment regarding grantees. I think I would find myself unable to endorse legislation that permitted funds to go to corporate enterprises that presently are spending five times as much money for advertising as they are for research and development. Government would be extremely guilty of misuse of taxpayers' money if this were carried out.

The provision of section 3, item 4, stressing adult education especially impresses me. I should like to add that we might start with an adult environmental education workshop for the Members of Congress and especially for the administration.

This workshop would serve not only to indicate their seriousness regarding environmental matters, but if these sessions were carried on mass media, the uniformed public could receive the dual benefit of their own education and a realistic assessment of the knowledgeability of their elected representatives.

Perhaps this is an unattainable dream of mine, but this might be the feedback that is needed to bring the system into balance.

The provision of section 3, item 5, which deals with the use of mass media for environmental education is the best provision of the legislation if—and perhaps a big "If"—and only if, the content chosen is compatible with the magnitude of the problem.

I believe that in testimony this morning, especially Mr. Brand's, concern over governmental intervention in media was discussed. I share the uneasiness in this matter, and I would caution you that, if mass media is used, let it be significant; a significant mass media campaign.

A mass media public relations campaign of environmental enhancement would push us over the brink. Education implies the assimulation of new concepts or ideas, not the reinforcement of presently held beliefs.

Another important point is, that you may have to develop programs that may make it tough for some present institutions to survive. I am not specifically addressing this to government or industry, but our institutions must become flexible because the natural systems that we operate within, just don't have the resilience to sustain our present cultural institutions.

My second specific criticism—it sounds like I have a lot of them—deals with the all-important advisory committee as per the provisions of section 5, item 5–B.

The composition of this committee will determine the success and effectiveness of the legislation more than any other single factor. The present legislation calls for a 22-member advisory committee. This figure appears to be too generous and I believe that a dozen well-qualified citizens would be sufficient to conduct the serious business outlined in the legislation.

The composition of this committee is critical and simply cannot be a who's who on the administration's list of benevolent good guys, a trend that I believe should be halted immediately, and I personally, see no need for a Rockefeller, a grand social matron or a Nobel laureate on this Commission.

This is what was alluded to in testimony this morning, and I concur that the era of patronage must pass.

I believe that membership encompassing natural and social scientist, political economist, citizen environmental activist, student and educator, both primary and secondary and higher education represented, would in my mind, provide the necessary balance for such a committee.

All members should be selected not on the basis of their area of specialization but for an overview or holistic perspective in their respective field or area of concern. There is simply nothing worse than getting highly specialized people together to talk about something general.

I am also extremely interested in an interpretation of the provisions of section 5, item 5–A. The provision to "evaluate programs and projects carried out under this act and disseminate the results of such evaluations," does not specify to whom the evaluation will be disseminated and how or in what form this is to be done. In the interests of an informed public, why not present the evaluation to the public through the use of mass media as proposed in the legislation. A public informed on the results of its investments would be in a far better position to support or reject policy.

A final criticism is directed at the failure of the act to provide even a vague definition of environmental education. Without a general statement regarding the congressional interpretation of environmental education, great problems could easily arise.

Learning how to operate a spacecraft is certainly environmental education. I believe you must be explicit or we will end up with still another NASA subsidiary. This we can do without.

The environment I have addressed my comments to is the environment of this planet—the environment which did not and never should require its most advanced species to wear artificial breathing apparatus or consume enormous quantities of corrective chemicals in order to survive biologically.

In closing, I must remind you that extensive environmental education for this country is a tall order. It is not just another field of study but indeed may be our only hope for survival. It will require a fundamental change in the American ethic.

We can no longer afford to accommodate only ourselves. Professor Scriven, in an excellent paper he prepared for the UNESCO conference, warns us, and I quote:

> We are about to enter a rather dangerous phase in the development of environmental education. It is about to become fashionable.

Thank you very much.

Mr. **Brademas.** Thank you very much.

STATEMENT OF RUTHANN CORWIN, UNDERGRADUATE STUDENT

Mr. **Brademas.** Miss Ruthann Corwin.

Miss **Corwin.** I am a little disappointed in the fact that there are only two of you here because it seems that much of the testimony that you have been hearing this morning could be learned from a great deal as to all people commenting on what they think and——

Mr. **Brademas.** We can't be every place. That is part of our problem.

Miss **Corwin.** I know; yes.

I wrote some very specific suggestions in different sections and so forth. I realize that one thing I neglected to do is put down all my credentials to make this official and so forth.

I will mention that I have a BA in philosophy from Berkeley because I am listed as an undergraduate—but a BA in philosophy and a BA in physiology coming up next month and I am a member of the Department of the Interior SCOPE Council and I have been getting a lot of interesting feedback of what the Government is doing.

At Berkeley I have been involved in faculty-student committees to try to form a graduate environmental program and I am on the graduate student committee.

Definition of Environment.

DEFINITION OF ENVIRONMENT

No definition of environment is clearly stated in the bill. I would hope that the administrators of the bill will interpret, therefore, the term in its broadest sense, to include all terrestrial ecosystems. If this is not the case, perhaps specific wording should be included.

GOALS OF EDUCATION

One question that comes to mind in analysis of this bill is that of the goal of environmental quality education that we have in mind. One goal is clearly spelled out in section 2 (a) and (b)—that of educating citizens and school children to the understanding of policies and support of activities.

Another goal that the framers of this legislation might want to include is that of educating people who can draft the policies and initiate the activities, that is, truly interdisciplinary people with a profound understanding of the interrelationships of many fields and sufficient expertise to appreciate the material of these fields, in order to be able to come up with solutions to the complex environmental problems.

We have very few of these people in the world today, and the nature of our educational system is not designed to produce a well-educated generalist. It is not enough to train the educators; we must have a way that those who teach the teachers can obtain the education that we think is necessary.

ELEMENTS OF ENVIRONMENTAL EDUCATION

I consider that a true environmental education should be aimed at the vision to see the world as a whole and all facets of a problem in their relation to each other, and the ability to work cooperatively with others.

In a world of limited resources, as we are coming to appreciate, we will have to learn to work with each other to establish equitable distributions, or we will perish fighting over scarce goods. Also with the complexity of environmental problems, one person cannot know all, and must work together with others to get complete understanding of a situation.

With these I would include the values of flexibility in being willing to try new approaches, and honesty in admitting one's lack of knowledge. It is crucial to our survival that no one pretend that he has information which he does not, and that no one be so ego involved with any one course of action that he cannot abandon it for a better one.

The holistic approach and the above values of cooperation, flexibility, and honesty can be embodied in traditional elements of education such as the ability to define problems and the boundaries of our knowledge, to evaluate facts and deal with value judgments in order to come to decisions, and to decide on methods by which decisions can be implemented, but we must add the dimension of an appreciation of the knowledge of many fields, so that one understands the social and technical possibilities, with deeper experience of one specific subject in order to understand the problems of research and the reliability of data.

The last element of education I will mention is also crucial to a true environmental education, for it makes obvious the world with which one has to deal, and that would be the experience of implementing a decision that one has made, and of evaluating one's effectiveness.

I would suggest that the above elements of education, especially those that are not now emphasized in education, be criteria for the evaluation of projects to be granted funds under this bill. I do not believe the bill is specific enough, and I am concerned that without guidelines of this sort, funding will go to traditional programs without sufficient emphasis on the interdisciplinary approach and the necessary values and experience.

SCHOOL EDUCATION

For example, all school education from primary to graduate might be given grants for those programs which eliminated the traditional curricular approach of dividing knowledge into specific subjects when teaching general knowledge. This might cover all of primary and most of secondary education, and most survey, core, and introductory courses in college.

The approach we have grown up under, in which we had English, history, math, social studies, science, and so forth, is antithetical to the holistic spirit of environmental education in which we must learn the relations of all knowledge. A unified approach might have the added benefit of solving the problems of alienation and lack of relevancy which students complain of, if students know how each bit of knowledge is related to the next and learn topics with a framework that allows them to see each subject in context of its application.

I am tempted to insert a digression on why I never learned trigonometry until very recently; that is, when I discovered I needed it, but I am sure everyone of us can come up with examples of that sort.

A few examples of unifying approaches. One is the Tussman idea, tried at Berkeley, where students study one topic, such as a period in history, from the points of view of all relevant disciplines. This is not environmentally oriented, but the idea is sound.

Another example is the education of Horatio in the novel "The Empire City," by Paul Goodman, where the precocious hero wanders around the city of New York learning to read from the newspapers and gaining all the knowledge of the city-economics, psychology, trades, physical environment, social structures, and so forth, through observation and interaction with the people of the city, even choosing for himself teachers in characters whom he wishes to emulate. Later in the book, one of Horatio's teachers describes a regular program of education of this sort:

A school where you never go into a school. There's no building, no special subjects to learn and no teacher * * *. You see, if from the beginning they put you in a building and separate you from the world you are supposed to study, then they have to bring the things back inside again and that's the teacher; and since he can't bring it all in, he makes a convenient selection, and those are the subjects.

Supposing you don't start that way.

A few pages on he throws in a teacher and a few principles, and a thousand and one lesson plans "in order that the teachers may have a storehouse of ideas to draw from. Now the way to get that is to experiment with a pilot group * * * but there's a sample to give you the taste."

I'd like to read them all because they are quite marvelous, but I'll just read one fragment:

> May fifth. Going uptown we start out early with a game of subway tag. Subway tag is a game where three try to catch three on the trains and stations. They can get off anywhere and ride two stations north or one south. (Special rules for express and local stops.) Let them find out by asking for information where they can cross over between northbound and southbound without paying another fare. The aim is to study the accuracy of such random informants. Who misleads you and why, do you think? How do the trainmen and the passengers put up with such a game when everybody is rather sleepy in the morning? This is the southbound rush hour: Note the sentiment of going against the crowd: Harder? Easier? Size up the train schedules. Play about one hour and arrive at Columbia. . . . A session of mathematics on the sidewalk outside the subway. Statistics of the passerby in different classifications; how many of what will come next? Which predictions were faulty and why?

For the last example, I would like to be able to present a core course proposal that we have been working on for the graduate program in environmental studies at Berkeley, as something that is going to happen. However, the ones I have here are only suggestions, and I must emphasize that because they are not as complete as they should be, and we are still working on getting such a program definitely accepted.

One thing that I would like to point out is that the preliminary recommendation from the students, which includes other environmental education elements than just the core course, calls for one core course which integrates the material proposed to go into several core courses by the faculty. Dr. Schultz, one of my fellow panelists today, presented the unified core course approach entitled "An alternative 'Core-Course' Proposal."

The student generally feels he has a much better understanding of the needs for a holistic approach than most faculty.

I have chosen the above three examples, the Tussman idea, Paul Goodman's suggestions, and the core course proposal as ideas which I believe embody many of the elements of the environmental education, specifically that which deals with an approach which integrates many factors of a single problem. For the section of the bill dealing with school education, I would suggest that guidelines be incorporated that emphasize this sort of project, as opposed to funding courses in ecology to become just another subject in the curriculum.

PUBLIC EDUCATION

Although I have left this topic for last, it is not what I consider least important. In fact, I have found from my own experience that education gained outside traditional educational institutions is more relevant, not just for adults, but for schoolchildren and college students—that is why I have tried to suggest broader school programs above which include actual decisionmaking and actions, along with an integrated approach to knowledge, which might have the benefit of making education more interesting and less alienated.

I would say that the majority of my educational experience in environmental issues has not come from University of California at Berkeley, but from the free University of Berkeley, ecology action, the ecology center, numerous conservation groups including active conservation tactics, the student group at Berkeley, the Sierra Club, and others, and many ad hoc groups, including a great number of my friends.

Aside from the reasons just mentioned on why education outside the traditional institutions appears to be more relevant, I might add for your consideration the thought that the values of working together, of being flexible and honest, cannot be taught very well in a system which places emphasis on competition in the form of grades, degrees, honors, and whatnot, and whose structure leads to the individual getting ahead and achieving security and defending it at the expense of others. This is even more true of industry. I would like to see in the bill language which would exclude grants from going to private profit corporation training programs, but would include definitely nonprofit corporations.

I hope that the bill will incorporate provisions which will make sure that money will go toward these less-structured groups. The suggestion has been made to this committee of a mini-grant for these groups. I don't see why, if their ideas are sound enough; that is, embody elements of education like those I discussed before—they can't have maxi-grants like any institution.

I would suggest rather, and this is the last time I will use this prefix, mini-forms. It has been pointed out to me that the groups that get the money are those who already have at least enough to fund someone to write a grant proposal, which, under the system of pages and pages of forms and itemization down to the last postage stamp, is quite a feat.

I would say, if the program sounds good, fund it, and then keep very close tabs on its progress, and if you are not satisfied that the people are coming up with what they have claimed, take the money away.

Perhaps the difficulty is in the followup, which is why Government agencies require such impeccable credentials and detailed form to get a grant—then they won't have to follow up closely to see whether the money is being misused or not. I would rather see many very experimental and noninstitutionalized groups get the go ahead to try their programs, outlined in sufficient structural and philosophical detail, and then have the money withdrawn from half when they don't come through, than see it all go to traditional institutions where there is very little further contact (annual reports) to see if they are following through, and where the programs might not provide the innovative, interdisciplinary education we would like to see.

SUMMARY

In summary, I will just outline the suggestions I have made above for changes in the bill which I believe will make it more responsive to those trying to achieve true environmental educations:

1. A broad definition of environment to be added for administrative guideline. Could be included in section 1, after line 4.

2. The addition of section 2(c) after section 2(b) on educating environmental generalists, those who will recommend policies and actions, and train the teachers, once they have received an interdisciplinary education. Under "Uses of funds", section 3, add (6), making grants which will fund such educations.

3. The incorporation of some sort of elements of an environmental education guideline to the administrators for the approval of applications, like those which I have suggested, which will make sure that the programs approved will lead to the kind of education, we want to encourage. This guideline should probably go under section 4.(a)(2) and section 5.(a)(3).

4. To go under section 5. as tasks for the advisory committee:

(a) Making changes in the traditional methods of review and deciding on grants so that forms could be simpler.

(b) Setting up methods of following up on programs and taking funding away if necessary, so that the initial funding procedures need not be so stringent.

(c) Making sure that the non-institutional groups can get funded. List prototypes in the bill if need be to assure administrative follow-through: Ecology Action; Ecology Centers; Free Universities; Sierra Club, and other traditional conservation groups; ad hoc environmental groups; ad hoc educational groups.

5. Advisory committee suggestion.

PRIORITIES

In terms of priorities I would say that the whole bill should have priority because of its importance to our future. Within the bill, I would single out the training of those who will teach the teachers and have the broadest understanding of environmental problems would be the logical first step, but since I don't think we have enough time to wait for that alone, we must get on with public education and school innovations the best we know how, immediately also.

Then, my last suggestion, I thought I would pick up what fellow panelists have said, my fellow panelists, and this is that the advisory committee—the nature of the advisory committee in accordance to what I read—this is going to be very important. The people on the committee are going to be very important.

I know from contact and experience that it is the college students now, the undergraduates and graduates who are doing the pushing, at least in most of the schools across the country—they are doing the pushing in getting this kind of a program established and they seem to know the direction as to who they should have and the students should have a say on who goes on the advisory board or they should be on the committee themselves.

I will just review my major point, viewing environmentalists and having some ad hoc nontraditional groups, pointing out district guidelines on what kind of education you want, that you do not have just the traditional ecology as a subject.

Thank you.

Mr. Brademas. Thank you very much.

Mr. Scriven.

Dr. Scriven. I would like to have 5 minutes.

Mr. Brademas. Yes.

STATEMENT OF DR. MICHAEL SCRIVEN, PROFESSOR OF PHILOSOPHY

Dr. Scriven. I would like to speak to you as somebody who has been involved in the last 6 years in an attempt to revolutionize the K–12 social study curriculum, not as a professor but as somebody who decided a number of years ago that we are in pretty bad shape at the high school curriculum and trying to do the same sort of thing that we did with the physics program after sputnik.

As a result of the housewife conference I got stuck on one of the committees and I have been on the board of directors now for 6 years and we have been funded most of the time and have spent the entire time at the national level trying to get the curriculum innovations in the needed areas created and then implemented.

Now, it seems to me that it is best to see environmental education in those terms because where it is at the moment, there is pretty well genuine enthusiasm for it in the same way that they were enthusiastic for true moral values.

But when it comes down to the question of how much they will raise the tax rate and which tax it is to be to fund precisely which activities, for example national seashore groups, then we begin to get into a much stickier situation.

It seems to me this is exactly like every attempt at reforming education with respect, for example, to trying to get American history taught in a way which really does pay some attention to constitutional principles or any of the other big movements we have had recently.

So the real question is, the practical question is exactly how do we get it done in a way that will lead to actual change in the voters' voting habits.

It's nothing less than that. We have already convinced the universities, we have already convinced most legislatures to a level where they agree with it in principle, but what we have to do is get around to the practical level and then implement it.

That means that the important measure is really how much change in the life space of the small schoolroom in the Midwest, in the ghettos in Los Angeles or New York or in the South can we actually achieve by what we do within, say, a year or 2 years because getting to the top 10 percent of the population is something that you can automatically do through the colleges, but getting to the remaining 90 percent is the hard spot.

What I have to say is in terms of that framework and I want to sort of tie it in to several other things.

It seems to me that, as I look at what is needed here, I see something exactly similar to what has happened in other cases.

Take, for example, the attempt to get some understanding of constitutional rights into the school system. What we actually have is a little bit of recitation of some of these things so that people can recite some parts of the Bill of Rights, recite it and then you say to them, "OK, you see a guy taking a picture of the bridge with a Japanese camera?" And then, "What are you going to do with them?" It shows 40 percent of the leaders in the American communities think that you should call the FBI and so on, and you get the absurd interpretations and the lip service to it.

Exactly the same thing is happening here. Everybody is for trees but not if it means that we are going to tax *New York Times* at the rate of 10 percent for every page that runs over 40 pages or something like that.

Everybody is for trees if it doesn't mean that we pass a bill outlawing paper towels which is what we should do, except for medicinal purposes, and yet they are tremendously expensive.

Everybody is for trees until it turns out that that means that it will mean a freeway which is important for gas taxes. How do we get it down to the level where they actually face the point?

We have a good deal of evidence how to do this from the long history of failure of social studies curriculum, at least negative evidence.

The first thing you have to recognize, I think, is that it is pretty well hopeless unless you tie it into other slices of the educational business. As an isolated piece it will get an isolated response.

People will not, in fact, learn to the point where they apply. The whole program of education in this area, it seems to me, must be tied into action around the school, around the college, in the community, in the State, and so on.

So any funding procedures ought to be firmly oriented toward curriculum changes—though some little amount should go into it—but the hard part is trying to get funding for lab-type activities and for getting the connections made for other parts of the curriculum so that you don't think of ecology teaching the second year of college, eighth grade, and then somehow you drop it out of your mind when you go to work for a large firm which is unloading 90 tons a day of contaminants into the North Bay atmosphere.

I suggest that the specific connections that have to be made is with other areas of the curriculum, particularly and clearly with the economics curriculum which you find explicit; the part of the social study curriculum sometimes, but nearly always some sort of a study under that name or otherwise, and with the political education which are pretty deficient within the school system, but we need to step up considerably political education, meaning education not only in the political philosophy but also in the implementation and decision about political action, which, of course, has to begin with action on the campus with respect to the things which students are involved with.

This must be tied in with sex education, not for reasons of family planning but it also automatically implies rather strong kinds of requirements that should be placed on the tax laws.

This implies, automatically, feedback into family planning; that is, both directly because you might value the environment and want to prevent its exploitation by an excess of population, and also indirectly because we've got to see how we are going to change the tax laws to support important restriction of family size.

It's got to be tied into sort of some sex education. It's got to be tied into continuing education, the crucial point being that in California, for example, we have for years operated on a system whereby all adult education must be self-funding. It gets no State support at all, unlike many other States.

This, of course, means that it is a disaster. You have to think hard how to subsidize these programs.

It's got to be tied into moral education, something which we have either had not at all or in the most absurd form in schools and which we have simply got to do more seriously.

The nearest thing that is serious is constitutional law education which you find in some rather exceptional law schools. That's only the beginning.

We are at a situation now where less than 1 percent of our college graduates, who are less than 10 percent of the population, can give an answer that makes any sense to the question of how you would justify democracy and how you would define it and that is something that we are prepared to kill a lot of people for.

The notion of morality is simply terminated at the point where scrutiny of our principle is at stake.

There is no ecology action without morality background.

There is no way that you can justify a feeling of interfering with other people—which is what you are going to do with ecology—and you can't justify that unless you can say, "I am doing it because of the following arguments."

I recognize the rights of others to do things in their own way, but. . . . This is the whole moral background.

So all these things are necessary not only to get it going, but it must have some explicit tie-in into these areas of education.

But, on the other side, it is possible to cash in on some of the efforts that are being made in these areas to get a little extra push onto the specific alternatives.

I think it would sum it up this way: Some time ago I was just sort of getting upset about the curriculum and I tried to construct from kindergarten to 16th grade an alternative curriculum which I find to be a survival curriculum and I tried to write this up in detail.

Now, what depressed me about doing this is that after you have listed what you got to teach people in order that, when they get released to society they can intelligently handle the choices that have to be made, when I got the list that you need to feed into them, I already had filled up the curriculum and I hadn't gotten to anything that is in it now.

I think that ecology is one of the things that has ecology, ecography, eco-tactics and each one of them has a place in a survival curriculum and will have to displace part of the repetitious myth—telling of American history to some of the students that leave school and that doesn't approve their behavior at all.

Now, we have to replace those things and have to, in fact, in some detail, do what other things ought to be in an ecology-oriented curriculum, if you make the analogous form in other areas. So it seems to me that part of the education of survival is to make a swing, and I think you are going to have to reach a little further than I have the impression you are doing.

We can in the same way pick up some support from other agencies.

Mr. Brademas. Thank you very much, Professor Scriven. Indeed I thank all of you. In my judgment your statements have been among the most valuable that we have had because you have turned on some of the fundamental issues of the introduction of a bill, that the introduction of a bill of this kind will raise.

I also am very much appreciative and sympathize with the motiff, the "Leitmotif" that I think runs through the statements of most of you that, you know, we are not doing enough and it is not fundamental enough and the legislation does not contemplate a thorough enough revision or reform, or, indeed, a revolution in some of the existing patterns of education in the United States.

I simply want to say that I am not at all unsympathetic with what you are saying, except that in our line of work—perhaps unlike a good deal of what all of you are saying—and I say this only descriptively—we are incrementalists.

Now, we can't really put in a bill and change everything in 24 hours—nor indeed in 24 months—so that my questions, I hope you will appreciate, are put to you in light of that observation.

Just following on what Professor Scriven just said, I must say, I think he makes a very good point in—indeed, all of you made the point, that in a sense you need, if you are to be effective, as effective in this area as one would like to be—you can touch on economics and morals and sex and the natural sciences and history and all the rest of it, except politically, and I premise this by saying that if you say, that, unless we do all those things there is no point in getting into this line of work, then we ought to fold up shop right away, because it is not—at least in my judgment—it is just not possible, given the way in which we make decisions in a country of 200 million people, it is not possible for any one of us as an individual Member of a 435-Member House of Representatives to push a button and make all these things happen that fast.

So I am just unburdening myself of that initial observation.

Now, if I could put a few questions to each of you that occurred to me as you were speaking, and I hope Mr. Hansen will join me in any point, because there are just two of us here——

Mr. Hansen. Yes.

Mr. Brademas. You were, Professor Schultz, concerned about the phrase which is suggested in the title of the bill "Preserving Environment and Maintaining Ecological Balances," that these are textbook or textbookish cliches, and you were then saying that as scientific or managerial concepts around which to develop sound education programs, they are horribly deficient and completely inappropriate.

Now, you are an authority in this field, why don't you come up with some language that you think would, in your judgment, be more satisfactory?

Dr. SCHULTZ. Yes. My point on this is that in any kind of business enterprise or what have you, you set a goal and then you attempt to achieve it, and I think this is what we ought to be doing with what our people, some people would call environment and what I prefer to call our ecosystem.

We should set a goal on what we want, what this system should do and then we manage for it.

Now, maybe ecological balance—whatever that means—would be our goal, but my point is that whatever this goal is, we should manage for it.

Ecological balance is sort of a trap, anyway, because it depends on what kind of spatial scale we are talking about, just for balance.

So I don't like the term at all. It is a nice thing for an elementary school to use in order to describe it, but this may not be the kind of thing we want to include a name for.

Mr. BRADEMAS. You have not answered my question. We have to write a bill—we don't have to write a bill, but assuming we are trying to write a bill, we've got to put some knowledge in it.

What I am trying to get from you is some knowledge that is more appropriate than the admittedly deficient language that is in it.

Dr. SCHULTZ. No, I don't——

Mr. BRADEMAS. I know you don't.

Dr. SCHULTZ. When I said that I deliberately did not want to rephrase it, it is because there are some terms like environment that everybody understands and I admit that everybody understands ecological balance, but when we really come to prepare a program, a program that is going to be sound, that you can work with in a managerial capacity, you know, that you can study and also solve problems in, then I think you have to have a more rigorous thing.

Now, I have never written a bill and I appreciate the problem. I think you ought to use language that tells it and that is best understood and I don't object to the terms of——

Mr. BRADEMAS. Well, I appreciate that. While I want to get language that is helpful, in generating support for a bill, I still think that ideas are terribly important and it is important that we get some of the fundamental ideas sorted out.

You don't quarrel with this proposition, do you? I don't think anybody on this panel would. If anybody can come to our rescue here with respect to helping us delineate more carefully, more accurately the purposes of the kind of bill we are talking about, I know that we would be very, very glad to get any ideas you may have.

Does anybody else have any suggestions in this respect?

Professor SCRIVEN. What we are doing to some extent, is responsive to your problem. We are giving you some sort of general thoughts about the background, the academic background, and in my business, the implementation game.

It is not going to affect your bill immediately, but you are thinking about the problems that come up with it. I am not suggesting that you should try to include all the things now, but only that you should face the fact that, to get it to swim, it will need to be tied to these other things—getting it into the curriculum when it gets down to the schoolhouses, the control that voting is going to take and hooking it onto other things because your curriculums are the most rigid objects in the nonlegislative world and they are not going to be moved by good ideas, they are not going to be moved by good policy.

So it is just a thought rather than a suggestion for immediate criticism.

Mr. **Brademas.** Well, indeed, one of the problems—as most of you have suggested—is, how do you get new ideas into the educational system?

Now, one can say, "Well, the present educational system is outrageous," but that, of course, doesn't solve the problem because it is here and, at least, it is my own view that one ought to not ignore this given reality and, where possible—since it does make a great impact on the lives of people for good or ill—see how we can help make it more effective, at least in respect to the problem we are talking about here today.

I wonder, therefore, if any of you would care to comment on the kinds of curriculums that you could foresee being offered in specially elementary and secondary schools.

Do you have any suggestions along that line?

Miss **Corwin.** Well, when I gave the examples, I was trying to suggest that approach, for example, well, it seems sort of obvious with just the games that we have been playing in Berkeley, where the money is, that's where people go.

If you are going to make money available to projects and stipulate that they ought to be intradisciplinary in nature, then people will come up with intradisciplinary projects for primary schools.

If a group came to you—or even if a group of people got together who want to start a school of their own outside the present system, because I think frankly that people who are doing that have a lot more chance to get ecological quality taught and if the program was there, they are going to take their students and show them the world, this sort of an approach, and where they didn't sit, well, you know, in the buildin—they didn't sit in the building but, OK, we will study math but at this point we will look at some one unit, a unit in time or a unit in place, for example.

Then, that would be an approach that I would say should get some kind of funding.

For example, you could come up with a problem and say, "This year we are going to study a city."

And they would study the city from the economics, they would study the city from politics, they would study the city from land use and space, the city in terms of power needs and system—you know, all the various realities that go into it and they didn't divide the subject matter up, you see?

Well, that would be an approach and I should say that there are a number of us in a different capacity who have been thinking of programs of this sort, including in terms of even graduate environmental education.

We are no longer working in the framework of the university but just something on our own. We have people who are very interested in taking the children out, more or less in the country—not only the countryside but the cities, because it is quite a wide spectrum, and using the environment around us such as take this, go live there for a week, and then just going around and using these various elements of our environment and then relating them.

Take them to an organic farm one day and talk about pesticides and take them down to the bay and there try to relate all these things together.

Now, this is a totally noncurricular type of approach. It is extremely innovative.

It hardly will get funded under a program, but that's the kind of thing I would like to see funded.

Professor **Scriven**. You see, it is so generalized that, if you are short of money, you simply have to look for the things that have to go to 50,000 schools and the trouble with that is, of course, not that it is noncurricular—which may be a very good thing about it—but because it is noncurricular, you can't package it up and transmit it.

It seems to be that you might want a mix of some of these studies, but I think you ought to go to the subsidizing, to the support of a case study materials book.

Now, that sort of thing can catch on very fast, not much doctrine but a case study of the paper towel, a case study of the *New York Times* as a consumer of newsprint; a case study of half a dozen things not put into very tough language, but simply making the connections.

Now, if you run up a thing like that, you print it cheaply and rerun it every time you get a big order of it, you can get into an awful lot of schools.

Then the biology teacher can use it, half a dozen teachers can use it without losing their identity.

In my experience, the fast move that really catches on happens to be centered around these relatively multi-use materials. I don't know how you write language like that.

Mr. **Brademas**. Mr. Pepper, were you going to say something?

Mr. **Pepper**. I might add that too many young people today have become reactive. If they have new ideas when they get home from school, they get pooh-poohed by the parents. This destruction of the inquisitive nature of young people, I think, is also partly due to this rigid compartmentalized primary education and it takes until you get to college to realize that it all doesn't fit together. Then you get rock throwing and other extreme reactionary type of behavior.

I would suppose that you are loking for all kind of suggestions, and I suggest you put provisions in all federally financed education legislation that the nature of the textbooks that are used must favor holistic or environmental education.

Mr. **Brademas**. Well, now, you raise another point that seems to me to be an important one also and that is the whole question of the training of teachers who after all are going to be offering these materials.

Assuming the availability of teaching materials, how we can help get at elementary and secondary school teachers?

Mr. **Pepper**. Well, the elementary and secondary school teachers that are being produced today in this country are in colleges and universities undergoing rapid changes and they are being exposed to the efforts internally in the universities to get a more holistic-type of education.

So we are undoubtedly in some revolutionary phase of evolving some more generalized elementary and secondary school teachers.

As far as specific programs, I couldn't offer any specific kind of suggestion outside of a course like the one offered by Dr. Schultz.

Dr. SCHULTZ. Yes. Yet it is very interesting that of all the students that I have had, I have had some 25 different departments represented in my graduate course, which indicates to me at least that it is of wide interest; but not a single student from the college of education.

There is something, there has been something, wrong here that people from the college of education have demanded that students have to have one single solid major so that, when they go into high school or elementary school education, they can teach at least one subject well.

This is the problem in the intradisciplinary field. There is a feeling here that that there should be this dominant thing and, then, even though the teacher talks about the environment in general, yet he may say, "Well, the chemical aspect is still the most important one."

Professor SCRIVEN. Let me just say a couple of things about this.

First of all, there is the sort of standard series of objections open in the implementation game. The present service and the in-service and the followup training kind of package implementation.

In this particular case, I think, unlike where you have your given new math program, the necessity for very long retraining of teachers is fortunately excluded. That is a serious problem with, say, introducing economics back in the elementary school, where you really have to put half your money into retraining your teachers.

Here, a lot of these necessities can be picked up very quickly by almost any teacher.

Let me suggest to you two things:

First, the short in-service training summer institute for which there is an enormous precedent and they are relatively well organized and they can handle serious materials like environmental approach, the blue series, the biology curricula material which is pretty well developed and not bad at all. So it is still not too hard for a teacher to pick up that particular tract, and, with a little subsidy you can get quite a divergence there.

That would typically be the leading biology teacher in the school. You don't need that for the case study stuff and I think that can be picked up by almost any teacher straight.

I think it is very important to state that I am not saying that you advocate some particular solution, but rather that you explain that you are stuck with making a series of decisions.

So I think in this subject which is not highly technical, unless you want to get to the graduate level, we can get an enormous amount in studying some case study materials, some summer institute for in-service training for teachers that are interested in switching to a total biology course committed to this orientation and perhaps a little pilot work for teacher colleges set up where you major there and to overcome exactly this kind of a roadblock.

Now, this doesn't have a daddy, it isn't chemistry or physics and you can't graduate with a credential, but that can be wiped out, that block.

This is an interesting concept, but I think the idea of the PR man whose job is to go around the schools of education and say, "Okay, gang, let's see if we can't find a way to make it possible to get a credential centered on this," I think it can almost always be done.

We have done it in a dozen areas. We have moved back to the elementary school and we thought it was impossible to do. Some could and some can't do it, but you can make a big change relatively quickly that way.

Mr. **Brademas.** Mr. Hansen.

Mr. **Hansen.** Mr. Chairman, let me echo the chairman's expression of appreciation. I think there were some very stimulating suggestions on this bill.

We will be grateful for any specific guidance that you can furnish to us when we get to the point of drafting actual language which will eventually end up in the statute books. The discussion illustrates the difficulty of our task, that is one of identifying some kind of goals that are fairly specific but, at the same time, leaving the kind of flexibility and room within there can be real innovative and creative action in implementing the bill.

Let me focus on one aspect of the educational process that has not yet been touched upon in the course of the hearings here today and get what response any of you care to make.

I refer to the very early years, so-called preschool years. Much of the time of our chairman and some of us on our committee over the last several months has been devoted to the the development of new legislation in this area of preschool programs.

We have been impressed with the emphasis that many specialists have placed on the preschool years as the most important in terms of the intellectual development of the child.

Now, if the goals of this kind of educative efforts, environmental qualitative education, are valid, than there presumably should be some environmental education component in preschool programs.

So I would ask the question for any of you to respond: What role do you think that this kind of educational effort should play to kindergarten and prekindergarten years?

Professor **Scriven.** Well, I was on the valuation staff of Headstart and I was concerned with it recently in looking at these things.

Now, in looking at these things, I think the lesson that we learned in evaluating Headstart was, with a high degree of modesty, stipulating the goals. There was a very disappointing result, I think, for most people, from their improvement as far as holding up and followup.

I think I have the feeling that, if we think about environmental education, the environmental education business, in terms of what we can learn or what analytical schemes they can learn, we are likely to be disappointed: but we can move in another direction and it may be a very good opportunity to try just that, and that is expanding the child's range of values, expanding the child's range of interests, enjoyments, pleasures by exposure and supplementary discussion in talking about explanations and so on; not in the hope that all the explanations will stick, but in the hope that there will be a shift in the set of learning and controlling attitudes in later years.

It's a very hard thing to evaluate, but by no means impossible.

I think that emphasis has been put on that and a deliberate attempt has been made. You know, I don't think it is—I don't think environmental education is just seeing trees and landscape, but also seeing many of the intricate things that are being jeopardized.

You might easily see the child follow it up in later years. I think my response, Mr. Hansen, is the direction should be there in modifying his set of values so that he develops an interest in nature, an interest in his environment and evaluating his followup in terms of his later choices.

Mr. **Pepper**. Not being a child educator, this is off the top of my head, but it seems to me that the expectations of a young child are a very important part of his future. If he is introduced at a very early age to a large number of artifacts and he develops a high degree of dependence on—I don't want to use technology—but on the products of a highly productive system, it may raise his level of expectation in future years. It might be well to address the preschool education to a more back-to-the-earth orientation.

Miss **Corwin**. I might just comment that I think you are going back to preschool programs and get them away from the parents; is that the sort of thing?

Mr. **Hansen**. What is your question?

Miss **Corwin**. Are you thinking in terms of preschool programs that are taking the children away from their parents and putting them into some other situation?

Mr. **Hansen**. I think it would probably encompass two types of programs:

The modified expanded Headstart programs where children are in a center but where services are also rendered to the children in their homes.

Miss **Corwin**. Well, it seems to me the best way to affect the children, the young children—the very young children—is through action-type things rather than explanations and so forth.

And, of course, the best way to do that in the second case is, you know, to educate the parents and then come to the children.

But the kinds of things which I think were very effective with children are that the teachers in their own lives—I guess it applies across the board and applies to you, gentlemen, and applies to us here—in a way that you act in your own life, you are acting in ways that show that you have a concern for the environment and for the world around you in the things that you do instead of just going on assuming that, whatever you do is OK and what you can get away with is OK and the children then will pick this up. This is sort of clear.

For example, my statement I typed in single space deliberately because I use less paper that way and if I had time to type a stencil, I would have mimeographed it and used both sides of the paper.

If you people want to do it in Congress, make sure it is on both sides and single spaced and explain why, and all the rest of the suggestions that you would like to list would I am sure come from that.

Mr. **Brademas**. The suggestion has been made.

Miss **Corwin**. But, of course, the way we act in our own lives, that is the way the children will react. Just by doing these little things, then, when they ask you why or tell you why, you know, you tell them. If they don't ask and they really perceive that you have comprehension, that the things that you do affect the world around you, you are going to make yourself responsible to the world around you.

I know that my parents are like this. As far as littering, my parents did not have that kind of attitude. I would never dream of littering because they had the attitude that the world is clean now and it is something that is against my inner being, it is something I learned so very young.

This kind of thing can be done at all levels and certainly government is a good place to start it. That will come back to the children.

Mr. HANSEN. Let me just ask one further question of Miss Corwin relative to your suggestion with which I fully agree if I understand it, that we make every attempt to provide an opportunity for what you call the nontraditional institutions to participate in the programs and it would be established in this legislation.

Now, if I interpret your comments correctly, then I share your criticism of a system wherein those members who are on the board and make the selections receive the lion's shares for programs that are funded by the Federal Government.

My only plea is for any help that you can give us in the way of suggested language that would make it possible for the nontraditional institution, that would make it possible, for example, for something like the College of Southern Idaho that has the same chance to participate as Harvard or the University of California.

Mr. BRADEMAS. Now you have gone too far. [Laughter.]

Miss CORWIN. Well, I really didn't mean colleges by nontraditional institutions.

No matter how small they are, the colleges and universities are still operating on the same set of values, competition and so forth. I don't mean institutions at all; you can call it an ad hoc group, I think, than an ecology sector which is a little bit more formal.

My suggestion for wording the bill was that you actually list prototypes of these sorts of groups as examples, as administrative guidelines, because then, if a group wants to get funded, that way they will be able to say, "Well, look here in the bill it says, for example, a group like Ecology Action, which can get this and list the description as an example of the kind of group that can be funded."

Then, you know, and ad hoc group of people, if they went together and try something like this and see that there is a possibility to write it in the bill describing specifically like the Free University, and these are really marvelous ways of getting an education because they are not free in the sense that there is no expense, but they are free in the sense that there is no competition, there are no grades, there are no scholarships or anything like that. You just go and you take the courses with the teacher. You just drop it and you take another one, whatever you like. I had a very marvelous ecology course, one of the first ones I took in the Free University before ecology became well-known, and we hiked with a gentleman up to Sonora Pass and, as we went up each level through Sonora Pass, this gentleman pointed out the level and the relationship to each level as we went up. This individual had done his thesis work on the biotic communities of the hillsides outside San Diego. That's the first time I understood the word "ecology."

It is this kind of thing, if you specifically say in the bill prototypes of the kinds of things that get the money, those would have to be guidelines administered in the program.

Mr. Hansen. Again, I concur with what you are saying, that any group—if they get together and come up with an idea that deserves to be explored and developed—should have the opportunity to make the proposal and receive some assistance.

The problem in drafting legislation, you see, is to identify the goal sufficiently but, at the same time, provide a fairly wide area within which entirely new ideas may be developed.

Professor Scriven. Well, there are two specific things that I really think your committee might do, Mr. Chairman, just because of your general obligations:

One is to really throw out the Office of Education application forms. They are the worst in the world, not just in the United States but they lead the world by far.

You probably have heard that kind of comment before, but I will say that I don't consider myself stupid but I found myself unable to complete the forms required to get postgraduate scholarships for one of my students, even after they had called me up and said, "We will give it to you, it's already awarded, all you have to do is fill the form in."

Well, I still couldn't do it, I mean in a period of some weeks. This is only when a signature is needed.

But I think if you are going in particular to Mr. Hansen's question, where he is looking for bringing in some of the groups that are not trained in groundmanship, it is terribly important to do that. I get scared off easily and they can't even manage first base.

But as a second point, I am against the university extending this sort of degree, including the Southern Idaho College, because it would be an unfair advantage for them since they still have an environment. [Laughter.]

Mr. Hansen. Well, we will try to hang onto it as long as we can. I made the suggestion to Dr. Martin when he testified and we were in agreement that we would like to have a one-page application form and I think that certainly could be improved and perhaps that might be one of the goals in implementing this bill, if we can get a very short form so that anyone can understand it and put down an idea and have the opportunity.

Professor Scriven. I would be happy to volunteer my services in helping in that.

Mr. Hansen. Thank you very much to all of you. Thank you, Mr. Chairman.

Mr. Brademas. I just want to make one other point:

Since most of you have been talking about the need for developing people who have a multidisciplinary perspective that, as Mr. Pepper pointed out, the Members of Congress and the administration and industrial tycoons are all guilty parties in this matter, so is the academic community.

I think you indicated that the guilt was on everybody, it was on all the citizens of the Republic.

One of the points made in that essay coauthored by John Steinhardt that, I take it, most of you are familiar with, is that in most American universities the rigidities are such that the department heads and the faculties are all very tenaciously clinging to their own jurisdictions, almost as outrageously as congressional committee chairmen under the seniority system, if you will, for a good comparison.

So if you believe, I take it you all do—and I know that Mr. Hansen and I certainly do—that ideas are terribly important in this whole area, if we are talking about developing attitudes—which is at the heart of the whole business—then I think we are going to have to rely on the American university community for at least some significant leadership in helping people like us in government as well as the citizenry in general to understand the need for taking a holistic attitude or multidisciplinary attitude, whatever adjective one wants, and I would just reiterate that I have found this—and as Mr. Hansen has already indicated—we have found your contributions enormously helpful to us in our understanding of this legislation.

If any of you have any other point or comment you would like to make before we conclude, why, I hope you feel free to do so.

Mr. PEPPER. I would just like to respond to that point with the question of how do you employ and who employs the generalist, and I think one of the major problems within the university today is that it is beginning to face up to the fact that specialists keep the specialists going. You are talking to a group of people today who would like to appreciably alter that trend.

But it merely gets back down to job security. It gets down to who wants to employ somebody who knows a little bit about everything and maybe——

Mr. BRADEMAS. That's what Congressmen are supposed to be for.

Dr. SCHULTZ. I would like to add one point to this that, as Jim mentioned, this is sort of a vicious cycle. You have a specialist who comes out as the product of a school and he gets the job with an employer who also is a specialist and who looks for specialists and then he is trained after he gets to be in that position and he wants specialists, too.

So this is a cycle that you have to break into artificially and produce the generalists and perhaps subsidize him so that you can stick him into this cycle, and this bill ought to provide that kind of a subsidy, something to produce generalists and put him into the cycle.

Miss CORWIN. Perhaps that kind of thing can go under this bill. If it can't perhaps it can come up under another one?

Mr. BRADEMAS. Well, I reiterate, Dr. Scriven, Mr. Pepper, Miss Corwin, and Dr. Schultz, I appreciate your contributions and indeed the contribution of all witnesses in San Francisco.

Tomorrow the subcommittee will be in Los Angeles. We thank you once again for the hospitality that has been extended to us by Dr. Lindsey and by the California Academy of Sciences in allowing us to have our hearings here.

The subcommittee is adjourned.

(Whereupon, at 4:46 p.m., the subcommittee was adjourned.)

ENVIRONMENTAL QUALITY EDUCATION ACT

SATURDAY, MAY 2, 1970

House of Representatives,
Select Subcommittee on Education,
Committee on Education and Labor,
Los Angeles, Calif.

The subcommittee met at 10 a.m., in room 8120, Federal Building, Hon. John Brademas (chairman of the subcommittee) presiding.

Present: Representatives Brademas, Bell, Reid, and Hansen.

Staff members present: Jack G. Duncan, counsel; Maureen Orth, consultant; Marty LaVor, minority legislative coordinator.

Mr. **Brademas**. The Select Subcommittee on Education of the Committee on Education and Labor of the House of Representatives will come to order.

For the purpose of further consideration of the bill H.R. 14753, the Environmental Quality Education Act, we are meeting here.

The Chair wants to state at the outset how very pleased we are to be here in California and in the Los Angeles area for the purpose of hearing witnesses on this significant piece of legislation.

For the benefit of those of you who may want to know who all of us are, on my far left is Congressman Orval Hansen of Idaho, Congressman Ogden Reid of New York and, of course, you are all familiar with your own Congressman, Alphonzo Bell, on whom I am going to call in just a moment.

The Chair would like to observe just an opening word with respect to this legislation.

The people of Los Angeles, one of the greatest cities in our own country and, indeed, in the world, face some of the most serious environmental problems in the Nation: dirty air, polluted water, and overcrowding, which are daily examples in most of our great cities of our continuing failure to develop intelligent and effective environmental policies. It is the judgment of most of the members of our committee that urban dwellers, especially, need education to help develop such policies. Yet the schools of our country and most communities today have almost no resources to teach about environmental problems. The Environmental Quality Education Act which we are considering in California here today is aimed at helping provide Federal support to our schools and in communities to provide teaching about the whole range of issues that we have come to call environmental.

The subcommittee is particularly pleased to be able to welcome here today or to invite to welcome us here today, our distinguished colleague, one of the outstanding members of the Committee on Education and Labor, your own Representative in Congress and one who has won the regard of members of this committee and of the House of Representatives on both sides of the political aisle, Congressman Alphonzo Bell, of the 28th District of California.

Mr. Bell. Thank you very much, Mr. Chairman.

Chairman Brademas, I want to commend you for your leadership in bringing these hearings out here.

Greater Metropolitan Los Angeles is on the front line in the increasingly urgent national battle against pollution.

Problems involving loss of control of the environment here, particularly our smog, have troubled us for almost a quarter of a century.

Local citizens have come to expect public officials to talk about pollution.

They do not have great confidence that public officials will do anything about it.

Perhaps for that reason, it is especially useful for the House Select Subcommittee on Education to hold one of its hearings here to take testimony on the pending Environmental Quality Education Act.

I am pleased to be a cosponsor of this bill.

I know there are many approaches, both long range and short range, which governments must soon take to achieve better environmental control.

The Environmental Quality Education Act is not a short-term response.

It is based, rather, upon a conviction that the problems which we must deal with in this field will be with us in some form for at least the remainder of the century.

The bill is designed to help our schools meet the serious need for environmental studies and authorizes funds for—

1. Developing materials for teaching courses concerned with our environment, conservation, pollution control and natural resources.
2. Training teachers in these fields.
3. Helping to provide ecology studies courses in elementary and secondary schools.
4. Organizing community conferences on our environment.
5. Preparing materials on the environment for use by the mass media.

This is not dramatic legislation, except to the extent that it underscores a very significant point about this problem.

Getting control and then, keeping control of our environment is a lifelong basis.

It will be a battle which our children will inherit after us.

And perhaps with better education, they will be better prepared to deal with it than we have been.

Thank you, Mr. Chairman.

Mr. Brademas. Thank you very much, Mr. Bell.

The Chair would like to observe that we have several witnesses today and we are going to move ahead as expeditiously as we can to hear from them and to put questions to them and then, we will make a judgment as we go along as to whether or not we will break for lunch or be able to complete our hearings in the morning session.

Our first witness is Mr. Rudolph J. H. Shafer, a consultant in conservation education, Bureau of Elementary and Secondary Education, California State Department of Public Instruction.

Mr. Shafer, we are pleased to have you with us. Go right ahead, sir.

STATEMENT OF RUDOLPH J. H. SHAFER, CONSULTANT IN CONSERVATION EDUCATION, BUREAU OF ELEMENTARY AND SECONDARY EDUCATION, CALIFORNIA STATE DEPARTMENT OF PUBLIC INSTRUCTION

Mr. SHAFER. We are pleased to have you visit us, in Los Angeles. We have an unusually nice day for you. We ordered that, especially.

Mr. BRADEMAS. Mr. Bell said he would arrange it.

Mr. SHAFER. You have a prepared statement which I have given you.

The need for this type of thing is well established. Perhaps it suffices to state that developing an informed public conservation conscience is what we are concerned with. We have to bring our personal habits in line with environmental problems and we also need strong public support for sound environmental policies and practices.

I wanted to briefly go over some of the things that have been happening in the State of California, in this particular area.

Since 1968, we have had a requirement in the State Education Code that instruction concerning conservation of natural resources is required in grades 1 to 12 in schools in California. We have had this on the books, now, for some 2 years.

Also, we have had a Citizens' Advisory Committee, working on this particular subject, to develop plans, guidelines and ideas and I have sent copies of their report to the committee. I think you have that on file.

This entire committee project and my activities in the Department of Education are funded under Title V, ESEA grant, which has been very worthwhile.

The Advisory Committee has recommended that we do something about teacher training because we realize that you can take away the building, you take away the blackboard, you take way the books and education can still go on as long as there are students and a teacher. Therefore, we feel that the place to begin is with teachers and teacher education. We are recommending a strong teacher-to-teacher training program in California, which we hope can be started next year.

We would like to see not necessarily administrators instructing teachers but teachers working with other teachers.

We would like to see, if possible, conservation specialists in each school area, that could work with teachers because we see conservation as something that cannot be taught in any one subject area, but has implications in many subject areas. We need a specialist that can help teachers discover these possibilities.

We would like to provide bus transportation for educational school journeys. We know that it is important to study the environment and to observe things firsthand but in many cases, transportation is not available. We would like to provide bus money for local districts.

For the last twenty years, we have had outdoor school programs in

California. We would like to see this program expanded. We also need to develop materials and guidelines at the state level for school use.

And so, this is where we stand.

At the present time, the title V project is finished. The Department, the Board of Education, the Resources Agency of California, the Governor's office, have indicated support for the recommendations of the advisory committee but, we have a problem of funding. The Governor's office has recommended that $174,000 of title V funds be used for this purpose in the next fiscal year. The legislature at present is considering bills to provide State funding for the program. We are trying to find some money, to do something with the recommendations of the advisory committee.

I had some specific suggestions on H.R. 14753. In our studies, we have viewed the subject of conservation as being principally the action of people in relation to the environment. For this informed conservation conscience we are considering, we feel that each student must have a background in basic ecology and man's relationship to the environment. The area of environmental technology, must also be covered. What can be done to the environment, what cannot be done. Another area that is very important is the social processes as they relate to environmental attitudes. We have recommended that these factors be recognized in the bill, and that the phrase "educating citizens in the areas of basic ecology, resource and environmental technology and the social sciences as they relate to environmental policies therefore necessary," be included. We feel this will be a little more encompassing than what you have.

I particularly like the section of your bill that refers to the national advisory committee. I think this would be an excellent program.

One thing that strikes me about the conservation education effort at the present time is that most States at least on paper are doing something. We know that there is a man in Nevada; we know that there is a man in Washington, and a man in Oregon, but there is very little or no interchange between these various people, and this is unfortunate. I think that we are beginning to view our environment on a regional basis and I think that we need some co-operation between the States on environmental programs. I think we need to get together and to talk over what we have done, what we have accomplished and ways that we can help each other and work together. I would hope that from this bill might come some kind of leadership toward considering environmental education on a regional basis and encouraging some interchange between the States. I would say that—it is important to secure State support and State interaction in these programs.

I have suggesed that funds be granted to a district or to an organization only when the State legislature or a large percentage of local government governing boards require that conservation instruction be provided.

We did not get very far in California until we had the State requirement on conservation. In California, the legislature sets the general outlines of the curriculum. In other States, this is not so and that is why I mentioned local school board action. It would seem to me there would have to be some kind of requirement. First, you would have to get their attention before you got any progress.

I would also suggest that the area of teacher training be strongly emphasized because we have to work with the teachers in the colleges. Perhaps you should insist that a State require their teachers to receive this type of instruction before they go into the schools. I have indicated that the State department of education and perhaps the resources agency or some State agency should be given a role of leadership in this field, preferably the State department of education, although in many States, the resources agency is charged with this responsibility.

This, in essence, is what I have to say on the bill. I would be pleased to answer any questions you might have.

Mr. **Brademas.** Thank you very much, Mr. Shafer.

I was interested in your statement to the effect that "we did not get very far until the State made conservation education a requirement." I think that is what you said.

Mr. **Shafer.** Yes, sir.

Mr. **Brademas.** But you have not gotten very far yet, have you, in California? You do not spend any money on this program.

Mr. **Shafer.** Well, the situation——

Mr. **Brademas.** You have had the law for 2 years but, as I understand it, you have authorized $174,000 but the State legislature has not given you any money.

Is that right?

Mr. **Shafer.** Of course, a district has its own funds which it receives from the State, which it can allocate for this purpose. There are no earmarked funds for the districts. There is provision in the law that we could provide grants for this type of thing, which we hope to be able to do, but, there are no specific funds for conservation education instruction. A district can use State support money for this purpose.

There is a lot happening in response to public interest. Perhaps the limited leadership we have been able to provide has caused this to happen.

At the present time in the State of California, we spend some $15 million a year on driver education and this is for one course at one grade level. We are proposing to spend $174,000 on a conservation education for all levels. I cannot set State policy but I give you the comparison.

Mr. **Brademas.** Given that kind of leadership in the State of California, why do you think we should go along with your proposal that we ought to give the State education a veto over expenditures of any Federal funds for environmental education in your State?

Mr. **Shafer.** Well, I think your point is well taken. I think you need the cooperation of the State agency as well as that of the individual district.

Mr. **Brademas.** Why do you need that cooperation?

Mr. **Shafer.** Because the State agency is in a position to help avoid overlaps and doing two things at the same time in different places. The State agency might also be able to undertake research projects. for instance, we are doing a study on conservation films, film strips. We are doing a study on free and inexpensive materials. This can be done once by the State and done for everyone. I feel that the State could be of assistance in this respect.

Mr. **Brademas.** I must say, I am sympathetic to your point. The State ought to be afforded an opportunity to make its views known but in—to be very candid about it, in the greatest State in the Union, you do not even spend a penny for education in this area, with the enormous natural resources and extraordinary pollution control problems that you have in the State. The suggestion that we should use Federal moneys for encouraging environmental education and then allow a State education authority which has not done any more than has been done by the State government in this State, that the yes or no power if a local school district or some local organization wants to carry on an environmental education course be so granted, I find very difficult to understand. In offering that observation, I in no way, Mr. Shafer, mean to suggest that I am unaware of your own deep concern about this problem. That is just my own——

Mr. **Shafer.** It gets kind of lonely, sometimes.

Mr. **Brademas.** You are sort of like a Christian in early Rome, I take it.

Your statement is very helpful.

Mr. Reid.

Mr. **Reid.** Thank you very much, Mr. Shafer, for your thoughtful testimony and your comments that I think can be read somewhat broadly, in some areas.

Has the Governor or the legislature given any indication they are going to give priority to environmental education or any real priority to doing something meaningful on ecology or is this essentially talk?

Mr. **Shafer.** The Governor, in a speech to an environmental conference, last November, in Los Angeles, indicated that he was aware of the report of the advisory committee on conservation education. He said that he would pledge all support to the State Superintendent of Public Instruction for this task.

Mr. **Reid.** All support short of money?

Mr. **Shafer.** Later, an item of $174,000 was put into the State budget but it is contingent upon the availability of Title V Federal funds.

Mr. **Reid.** Might I ask how far, in your considered opinion, those would go in the State system toward what you consider an adequate figure? I understand your personal position but what do you think you really need here if we are going to do a meaningful job?

Mr. **Shafer.** I would say that $174,000 would enable us to do some things. We have some 6,000 public schools in California, and 100,000 teachers. You can see that there is not an awful lot we can do on a budget of this type.

The advisory committee has recommended programs of a substantial amount, perhaps $4 or $5 million, as a starting point.

Mr. **Reid.** That would work out at $29 a school.

Mr. **Shafer.** Perhaps so. And, of course, a lot of that would become lost in administration. The advisory committee, feels that this is not an adequate amount, by any means.

Mr. **Reid.** Well, I certainly wish you well and I hope you get some substantial funding for the program because I think the problems you have got are of critical proportions as are those in New York State.

Mr. **Shafer.** I feel that someone is going to do the job of environmental education. I think that the people who would destroy our form of government—the anarchist types—are trying very hard to preempt this field. I feel that it is important that the so-called "establishment" move strongly in this area because if we stand off and taken no action we are in for trouble. There is an effort to subvert the conservation movement for selfish purposes by various groups. We, as, quote, the "establishment," have got to get off the dime on this.

Mr. REID. I agree with your theories but I am not sure I would agree that it should be only the establishment.

Mr. SHAFER. I mean all people should be concerned in this. Perhaps the choice of the word, "establishment," was not good.

Mr. REID. Thank you.

Mr. BRADEMAS. Mr. Bell.

Mr. BELL. I admired the statement of the chairman a few minutes ago when he said this is the greatest State in the Union. I certainly concur.

In your——

Mr. BRADEMAS. The gentleman from New York was remarkably silent.

Mr. REID. My observation was demographic.

Mr. BELL. In your teacher-to-teacher training, Mr. Shafer, would you utilize a workshop concept of conferences for the exchange of information?

Mr. SHAFER. Yes, sir. What we have discussed is selecting a number of key teachers throughout the State. These teachers would represent many disciplines. We would gather perhaps 100, 200 of them and go to some place like Abilomar. We would pay their way to this conference, pay the district whatever amount it would cost to get them relieved, and work intensively for perhaps a week or two. We would invite in various areas of the community including business people, the various governmental agencies, college people, and so forth. We would conduct a very intensive 2-week program and then these people would go back to their districts to work with other teachers.

We would hope to give them a stipend of some kind if they worked on weekends.

Having been a classroom teacher, I know some of the best help I got was from other teachers. We think this might be a good way to go. It would not be possible to take every teacher in the State of California and give them a course on ecology or conservation, right now. We are talking about 100,000 people. This is one way we feel we could do it. Later we could take another group of teachers another time and move different areas through the State. We would get a kind of a wave-type of effect, hopefully spreading throughout the educational system.

Mr. BELL. Do you believe an environmental education program should include political science courses, with a view to informing students about avenues and ways to bring about change, ecologically speaking?

Mr. SHAFER. Absolutely. Conservation concerns the actions and the attitudes of people toward the environment. The environment does not really need us to get along. When you help students develop a feeling of love for nature, and an understanding of relationships, you must also show them the processes by which these environmental policies are developed and how they can be changed. This involves politics, and economics. We vote economic policies with our dollars. We say, "Don't cut down redwood trees," but we buy redwood patio fences. We recommend that Detroit develop a small car and then go out and buy one of the 500 horsepower jobs. I think it is essential that we get into this area of how our policies and attitudes are determined, even our philosophical attitudes. We have been taught that man shall have dominion over the earth and subjugate everybody and everything in it. Our churches must help us with our philosophical attitudes toward environment.

We are certainly talking about the political situation. You gentlemen realize that some of the things that you do dramatically affects the environment.

Mr. **Bell**. Do you think the money for the conference you mention should come from the State?

Mr. **Shafer**. I would think it would be very important that every State participate. Dr. Wilhelmena Hill of the office of education, has published a list of people in each State who are responsible for environmental education. There is at least a name for every State in the United States. These people ought to be brought together. Perhaps we ought to do it on a regional basis first, and then come together and exchange ideas and information. We could cooperate on publications and studies and eliminate duplications.

We ought to be exchanging this information and we ought to form a regional or perhaps even a national—I hesitate to say a "program," but I think it is important that we make it clear that it is not California conservation or Oregon conservation but conservation of the entire Nation. We need to work together and meet regularly and exchange ideas and help each other.

As I say, there is a man in Oregon that is responsible for conservation education. There is a man in Washington also I meet them once or twice a year at various conferences. We say, "Hello. How are you getting along?" I do not have funds to travel out of the State. I know the man in Oregon does not. We might be able to meet at the State line and talk across the line. It would be important, that everyone participate in this and if a State could not afford to send a delegate, then it should somehow be a Federal concern. I would hope that the Federal Government might at least provide leadership for this type of thing.

Mr. **Bell**. Just one more question, Mr. Shafer.

Mr. **Shafer**. Yes, sir.

Mr. **Bell**. Mr. Shafer, Dr. Libby from UCLA, testified before one of our committees sometime ago and he advocated that we establish a course—a graduate school course—in ecology, which would be a 5-year program in which the graduate would come out kind of like an M.D.

Mr. **Shafer**. Yes.

Mr. **Bell**. And he would have the broad gage of understanding of all forms of ecology.

Mr. **Shafer**. Right.

Mr. **Bell**. And would then become kind of a specialist in the broad field.

Mr. **Shafer**. Yes.

Mr. BELL. And then more or less render opinions and so forth to the different departments of Government and industry and so on.

Mr. SHAFER. Yes.

Mr. BELL. Do you like this concept of a training course of this kind?

Mr. SHAFER. This sounds like a good idea. I think we are getting into an interdisciplinary area and I think this is good. One of our colleges is developing a master's degree in a conservation education specialist program for a person that would specialize in educational techniques. We must not lose sight of the fact that it is important to move in the areas of the colleges and the university training but remember that 50 percent of what a person knows is learned in the first 6 years of life. We must put a strong emphasis in the early grades because this is where the attitudes, the basic attitudes, policies, and understandings are developed. We need to spend a tremendous amount of effort at the lower end of the scale, if we want to develop a feeling that it is you and it is your responsibility instead of Smokey Bear's responsibility. In other words, I think we need parent education, preschool programs, and strong emphasis in the elementary grades. As you say, the emphasis at the college level is important, but we must not overlook this lower end.

Mr. REID. Mr. Chairman.

Mr. BRADEMAS. Mr. Reid.

Mr. REID. I would merely move that the report to the California State Board of Education on which Mr. Shafer worked be included in the record and printed. It seems to me to be a very comprehensive report.

Mr. BRADEMAS. Without objection, it will be included.

(The article referred to follows:)

A REPORT TO THE CALIFORNIA STATE BOARD OF EDUCATION BY THE CONSERVATION EDUCATION ADVISORY COMMITTEE

STATE OF CALIFORNIA,
DEPARTMENT OF EDUCATION,
Sacramento, Calif., August 6, 1969.

CALIFORNIA STATE BOARD OF EDUCATION,
Sacramento, Calif.

DEAR BOARD MEMBERS: Throughrout our State and nation there is a growing public awareness of the serious environmental and resource use problems facing mankind today. The informed citizen expects his educational institutions to equip youth with the knowledge and attitudes necessary to develop solutions to these problems.

A modern philosophy of conservation is founded upon environmental unity. The problems of uncontrolled growth and development are problems of both the city and countryside. The productivity of our forests and farms can no longer be separated from the productivity and liveability of our cities—the downgrading of part of the environment inevitably affects the total upon which all life on the planet depends. Conservation requires the rational use of the physical environment to promote the highest quality of living for this and future generations. Conservation education must be dedicated to achieving an environmental quality in which the individual can make the highest and wisest use of his talents and potentialities.

An informed public working for the common environmental good through its democratic institutions at all educational, private interest and professional levels can break the chain of destructive land use, restore the land which has been abused and build balance and beauty into our cities of the future.

An educational program designed to build such attitudes of stewardship toward maintaining the quality of our common environment enabling citizens to use wisely, not destroy, the resources at their disposal may be defined as conservation education. The Conservation Education Advisory Committee to the State Board of Education was established to determine the status of conservation education in California and to make such recommendations as they consider appropriate. The following report details the work of the Committee and contains recommendations for the consideration of the California State Board of Education.

In your charge to the Committee, which is found in the Appendix, you requested that these specific areas be studied in detail:

1. Teacher training at both the undergraduate and inservice levels.
2. Cooperation with governmental, industrial and private organizations to provide worthwhile printed materials, films, field trips and other resources for teacher and student use.
3. The conservation content of State adopted textbooks.
4. The role of the State Department of Education and Resources Agency in Conservation Education.
5. Recommended school conservation education programs in grades one through twelve.

Since the fall of 1967, the Committee has been holding regular monthly meetings. Early sessions were devoted to gathering materials and reviewing the current status of conservation education in California. During the past six months the Committee has been diligently putting their thoughts and findings into writings in the hope that the recommendations we make will be of value to you in your service to the children and citizens of California.

Membership of the Committee has changed during the period of our deliberations. Of the original membership, only Dr. Samuel Wood was able to serve for the entire time. The present Committee wishes to express its appreciation to these former members who made a contribution to the final report now before you:

David Hurford
Paul McCloskey
Casper Weinberger
Rodney Heft

The Committee as it now stands represents a wide spectrum of conservation interests and has, over the past months, developed into a coordinated, working team well suited to its task.

Two pieces of legislation enacted after the Committee was activated greatly increased the importance of our project. Senate Bill 1, signed into law in 1968, requires that adopted courses of study shall provide for instruction in "protection and conservation of resources" and "man's relationships to his human and natural environment" in appropriate grade levels and subject areas, grades one through twelve (*Education Code* Section 8503, 8551–c, 8571–b). Senate Bill 206, also passed in the 1968 session, established in the Department of Education a Conservation Education Service to encourage and assist school districts in developing and maintaining conservation education programs. The bill also authorized the Superintendent of Public Instruction, upon the recommenadtion of the Conservation Education Service, to make planning grants to local districts to help them develop conservation education programs suited to local needs (*Education Code* 363.5, 6011.5). Unfortunately, no funds were provided for the services authorized by Senate Bill 206. Senate Bill 1392 was introduced by Senator Moscone in the 1969 legislative session to appropriate $125,000 for this purpose, but the bill died in the Senate Finance Committee.

The resources of education, public agencies, and private conservation organizations must be unified and directed toward improving conservation education programs offered to pupils in the schools of California. Both financial and human resources in generous quantities will be needed if we are to help children develop an attitude of stewardship toward their environment and its resources.

Considering the alternatives—the loss of natural beauty, depletion of resources, and even the loss of the ability of the environment to support life—a major effort is clearly in order. The problem is great and the time is short. Let us act now while there is yet time. The Committee respectfully recommends that members of the State Board of Education carefully study the following report and take action to implement the recommendations it contains.

Sincerely,

Jack Davidson, *Chairman*,
Advisory Committee on Conservation Education.

Biographies of Advisory Committee Members—Conservation Education

JACK DAVIDSON, CHAIRMAN

Mr. Davidson has served as Curriculum Consultant specializing in conservation and outdoor education in the Office of the Los Angeles County Superintendent of Schools for the past fifteen years. He is a founder and past president of the Association for Outdoor Education and is on the Board of Directors of the California Conservation Council and the Southern California Section of the American Camping Association. He holds a bachelors degree and a masters degree from the University of Southern California and has taught at elementary secondary and college levels.

PEGGY WAYBURN, VICE-CHAIRMAN

Mrs. Wayburn is a free-lance writer and conservationist and mother of four children all of whom attend California public schools or the University of California. She is active in several conservation organizations including the Sierra Club, People for Open Space and the Point Reyes Foundation. She holds a Bachelor of Arts Degree cum laude from Barnard College, Columbia University and is currently working toward a masters degree in ecology. Mrs. Wayburn has served as Associate Editor of Country Book Magazine and as copy writer for the J. Walter Thompson Advertising Agency of San Francisco. She is a frequent contributor to the Sierra Club Bulletin.

LOREN B. GOOD

Mr. Good presently serves as Executive Vice-President of the Redwood Region Conservation Council and has long been associated with projects and programs involving the cooperation of educators and the business community. He is a member of the Board of Directors of the California Conservation Council and a member of the Education Committee of the American Forest Institute, the national information and education arm of the forest products industries. In addition, Mr. Good has worked as a public relations executive and manager of a community newspaper.

ROBERT B. HICKS

Mr. Hicks is Project Manager for the Walt Disney Productions Mineral King Development. Mr. Hicks holds an Associate of Arts Degree from the College of the Sequoias, a Bachelor of Science in industrial engineering and a Master of Business Administration from Stanford University. Mr. Hicks has worked as an airlines pilot for Pan American Airways, and as an economist with the Stanford Research Institute. He has also owned and operated a property and land management firm.

RAY HUNTER

Mr. Hunter is presently serving as Director of the California Farm Bureau Federation Natural Resources Department. He served as Director of National Resources for the Illinois Agricultural Association for eight years before accepting his present position in 1958. He holds a Bachelor of Science Degree in agriculture from Western Kentucky University and a masters degree in soil and water management from Iowa State University. Mr. Hunter has also served as a teacher of vocational agriculture and worked for the United States Soil Conservation Service. He has been very active in the Soil Conservation Society of America holding various offices including the national presidency. In 1968 the Society awarded its highest honor, the Degree of Fellow, to Mr. Hunter.

SAMUEL E. WOOD

Dr. Wood is a lecturer and author in the field of conservation and a consultant to California Tomorrow, an organization he co-founded and served many years as executive director. He received his Ph. D. in economics and political science from University of California at Berkeley in 1940 and has worked for the U.S. Department of Agriculture, Bureau of Reclamation, U.S. Department of Interior and as a legislative committee consultant, California Legislature. In addition, Dr. Wood has taught at the college level and has prepared regional and statewide developmental plans for California, New Mexico, the Province of Manitoba, Canada and several California communities. He has prepared many articles and reports and is joint author with Alfred E. Heller of the California Tomorrow Publications *California Going, Going* (1962) and *The Phantom Cities of California* (1963).

PAUL ZINKE

Dr. Zinke is an Associate Professor of Forestry at the University of California and has published thirty-four technical works on soils and forestry and fifty-eight quadrangle maps classifying soil and vegetation in several areas of Califonia. Dr. Zinke received his Ph. D. from University of California, Berkeley in 1956 and has worked for the U.S. Forest Service. He is a director of the Califoria chapter of the Soil Conservation Society of America, a director of the California Native Plant Society, served as a member of the Conservation Committee of the Sierra Club and has served as chairman of the California section of the Society of American Foresters.

JANE WESTENBERGER

Miss Westenberger graduated with honors and a Bachelor of Arts Degree from Long Beach State College and later earned a Master of Arts Degree graduating "With Great Distinction". She holds life credentials in elementary and secondary teaching and general school administration. She is very active in many conservation associations and was a recipient of the Merit Award from California Conservation Council and Howard Bell Award for contributions in outdoor education from the Association for Outdoor Education, Inc. She is a former member of the Governor's Advisory Committee Public Land Law Review and past State president and board member of the Association for Outdoor Education.

WILLIAM WAKE

Dr. Wake is an Associate Professor of geography at Fresno State College, Bakersfield Center. He received his Ph. D. from University of California at Los Angeles and founded the organization Conservation Education Research Action (CERA) in Bakersfield. He has several publications to his credit in the geography and conservation fields and serves as director of the California Conservation Council, the Director of the Consortium of Professional Associations for the Study of Special Teacher Training Programs and is third vice-president of California Conservation Council and a member of the State Advisory Board of the Bureau of Land Management.

RUDOLPH J. H. SHAFER, COMMITTEE CONSULTANT

Mr. Shafer is employed by the California State Department of Education as an ESEA Title V Project Specialist in Conservation Education. He is a graduate of the University of California at Santa Barbara, and holds a Master's Degree in School Administration from the University of Southern California. He has been a classroom teacher, assistant principal, Public Information Officer, and Specialist in Conservation Education in the Los Angeles United School District. In addition, he has served eleven summers as a seasonal ranger for the National Park Service. He is a Director in the California Conservation Council, and has received a merit award from that organization.

THIS WE BELIEVE:

Most educators and politicians are lagging far behind public thinking on conservation.

For the past quarter century or more, both groups have been too preoccupied with other issues they believed were once urgent.

Neither has yet made a serious effort to keep the conservation concept abreast of man's technology and his awesome ability to defile, pollute, poison and destroy his own habitat.

This, although the electorate in a recent statewide public opinion poll ranked the problems of natural resource conservation as more urgent than those of crime and law enforcement, poverty, race relations and education.

And despite voting proof that most Californians of all income groups, while dead set against tax increases for anything else, are willing to pay additional taxes earmarked to save or improve their natural surroundings.

What barely missed becoming landmark legislation in the field of conservation was passed and signed into the State *Education Code* in 1968. It requires, for the first time in history, that California schools, from first grade through high school, provide instruction in natural resource conervation and man's relation to his environment.

The Act fell short of its mark because support funding was not provided to carry out the program. Program funding, or the lack of it, is a fair measure of the seriousness of legislative and administrative intent.

Without long-term funding, without specially trained teachers, without needed materials and meaningful outdoor study opportunities, conservation education remains a stepchild in the crowded family of public education. A bright and promising child, but ignored or neglected, with little nourishment of any kind.

Meanwhile, the battle for wise use of California's natural resources is still being lost on virtually every front. Each succeeding day diminishes the ability of our environment to renew the meaning and the worth of living.

Sound solutions to California's conservation problems must involve total resource management supported by an informed public and responsive government.

Basic to the solutions is a public with a conservation conscience—aware of what is theirs, aware of the values and choices, and sensitive to the needs of generations yet to come.

Adulthood, with its fixed beliefs and special interests, is anything but fertile ground for growing unbiased attitudes. If we are to have a valid California conservation conscience we must grow it in the open, searching minds of childhood and youth.

Conservation education woven into the total fabric of our school system is the key. But, to be effective, conservation education must be adequately funded and provisioned, and taught with skill and understanding.

Thousands of teachers with no conservation education background must be provided the pre-service and in-service training they will need. Every effort must be made to make these courses as effective as possible for the quality of the teaching will determine the quality of the results.

Local, state and federal resource lands are available statewide as outdoor study areas to augment and complement those on school grounds. Legislative grants must be provided to assist in developing such school ground areas and to provide bus transportation to distant environmental study areas.

We who have already short-changed tomorrow can hardly do less.

Today's youth, in search of the great natural heritage of its forebears, has good reason to be disquieted. Man's obsessive assault on California stands out in bold relief.

The time is late, but a fresh start must be made toward developing an informed conservation conscience for California.

If the State is to provide leadership rather than lip service before it is too late, the time to act is now.

Section I.—Key Findings and Major Recommendations

THE DEPARTMENT OF EDUCATION

1. *Finding:* Senate Bill 1, 1968 (*Education Code* Sections 8503, 8551–c and 8571–b) requires that adopted courses of study provide for instruction in conservation and use of natural resources in all California Schools, grade one through twelve. Senate Bill 206, 1968 (*Education Code* Section 363.5) created without funding, a Conservation Education Service in the Department of Education.

Recommendation: Recognizing that the effectiveness of the program is directly dependent upon the funding provided, the State Board of Education should direct the Department to make every effort to provide adequate funding for the Conservation Education Service created by the legislature for the purpose of assisting local districts in meeting conservation education requirements of the *Education Code.* (Section VII)

2. *Finding:* To be effective, the conservation education service in the Department of Education must be adequately staffed and must be in close contact with the schools as well as with governmental agencies, industry and private conservation associations.

Recommendation: The Committee recommends that the Department of Education assign a fulltime consultant to the Conservation Education Service, and that a permanent advisory committee representing various conservation and education interests be appointed to assist and advise the Board, and the Department of Education on Conservation education matters. (Section VII)

3. *Finding:* In meeting their obligations in the conservation education field, local school districts and county offices need materials and guides to assist them in planning programs suited to local needs. The production of such materials is often beyond the resources of local school districts and County offices.

Recommendation: The Committee recommends that the Department of Education, through the Conservation Education service, develop a conservation education outline or framework listing essential concepts and showing possible curricular applications in many subject areas and grade levels to assist local school districts in preparing educational programs suited to local needs. Such a framework will be necessary if the conservation implications of the proposed social sciences framework are to be properly taught. The Committee also recommends that other guides, catalogs, and materials which would be of value in local program planning be prepared by the Department and distributed to the schools. (Section VII)

LOCAL SCHOOL PROGRAMS

4. *Finding:* Sections 8503, 8551–c and 8571–b of the California *Education Code* require that adopted courses of study shall provide for instruction in ". . . protection and conservation of resources . . ." and in ". . . Man's relations to his human and natural environment" at the appropriate elementary and secondary grade levels and subject areas. The language of the law clearly indicates that conservation should be taught, not as a separate subject, but throughout the entire curriculum whenever and wherever possible, grades one through twelve. In addition to a strong classroom program at all grade levels conservation education must include first-hand experiences with the natural world. School districts often lack adequate funds and facilities to provide such outdoor experiences.

Recommendation: The Committee recommends that the State Board of Education urge local boards of education to provide for the strong implementation of the provisions of the *Education Code* relating to conservation. Such local implementation should include:

Development of a strong local conservation education policy statement;

Production of locally oriented curriculum guides and other materials necessary to properly teach conservation in appropriate grade levels and subject areas throughout grades one through twelve;

The establishment of a required conservation course at the secondary level to re-emphasize and tie together the conservation concepts studied in lower grades;

The establishment of permanent outdoor study areas on school grounds or elsewhere in the district or community;

Provision for educational school journeys to study natural and man-modified environments when such experiences are indicated in the curriculum.

The State Board of Education should urge local, state and federal land and resource management agencies to make their land areas and facilities available for school use and assist educators in setting up worthwhile programs. (Section III)

5. *Finding:* Providing funds for the development of natural study areas on school grounds and other conservation education areas within a school district, as well as funds for pupil transportation to outdoor areas, is a serious problem for many school districts.

Recommendation: The Board of Education should urge the legislative to provide the funding necessary to assist school districts in meeting these needs. Districts should be required to meet state established minimum program standards to receive such funds. Planning grants authorized under Section 6011.5 of the *Education Code* could be used to assist districts in developing such programs.. (Section III.)

6. *Finding:* The resident outdoor school in which students and their teacher spend two or more days in a natural study area learning about their environ-

ment under the direction of specially trained teachers has been found to be a most effective means of teaching conservation. Although many districts offer such a learning experience and many more are planning to do so, not nearly enough students are permitted to participate in such a program.

Recommendation: It is recommended that means be provided to greatly expand outdoor education programs in California. Specifically, these areas of encouragement should be explored:

State supported and State operated outdoor schools on public land.

Special outdoor education funds from the legislature, perhaps in the form of revenue bonds to build outdoor education resident school facilities on public lands.

Enabling legislation to permit local districts to levy special taxes for outdoor education programs. (Section III)

TEACHER TRAINING

7. *Finding:* A well-trained teacher is the key to a successful local conservation education program. Teachers must be convinced of this and must be instructed in the philosophical, scientific, technological and social aspects of conservation. In addition, they must be given instruction in the specific techniques of teaching conservation at their particular grade level and subject area. Such instruction is not generally provided in undergraduate programs at present and most of the teachers now teaching lack these skills, knowledge and attitudes.

Recommendation: The Committee recommends that the Board of Education urge all appropriate agencies to set up programs to instruct teachers and teacher trainees in the philosophy, principles and content of conservation as well as in specific conservation teaching techniques.

Preservice training

Preservice teacher training must include as a minimum, one three unit course in the philosophy, politics, economics and sociology and ecological aspects of conservation. This course should also provide the prospective teacher with a knowledge of how to integrate conservation instruction within the various subject areas and grade levels as required in Section 8503 of the *Education Code* as well as with specific instructional techniques for teaching conservation. It is recommended that such a course be a requirement for graduation. (A suggested outline for such a course is contained in the appendix, pages 41–47.)

It is also recommended that other courses in the preservice curriculum include the conservation concept where appropriate.

Inservice training

Providing conservation inservice instruction for a large percentage of teachers in California will be a major undertaking, but the Committee feels that such instruction is essential. The following recommendations will expedite such a program:

Institutions of higher learning should be encouraged by the Department of Education to provide suitable summer session classes for teachers.

The Department of Education, governmental resource agencies, industry and private conservation groups should combine forces to provide summer or weekend conservation classes for teachers.

The active support and cooperation of county school offices should be sought by the Department of Education in planning and developing inservice programs.

Local districts should give teachers salary-point credits or other compensation for attendance at conservation inservice classes.

All courses should utilize the outdoor environment when appropriate. (Section IV)

COMMUNITY ASSISTANCE

8. *Finding:* Private conservation agencies, industry and governmental resource agencies can make many valuable contributions to the conservation education effort and are, for the most part, anxious and willing to be a part of this important work. Printed materials, films, speakers, technical information, field trips and other services are available from these sources.

Recommendation: The Committee recommends that the Board of Education and educators throughout California recognize the benefits to be gained from the various areas of conservation interest and welcome their contribution to the conservation education program. Specific steps which should be taken to expedite such cooperation should include:

Close cooperation between local educators and the various resource management and conservation agencies in the community.

Close cooperation between Conservation Education Service in the Department of Education, and these agencies and organizations in developing and implementing a statewide conservation education program. (Section V and Section VII)

TEACHING MATERIALS

9. *Finding:* Well-trained teachers must have good classroom teaching materials if the conservation education program is to be successful. High quality textbooks, supplementary books, film strips, picture sets, motion pictures and other materials are not presently available in adequate supply in most California schools.

Recommendation: The Committee recommends that the following action be taken to provide needed conservation teaching materials:

The Board of Education should direct the Curriculum Commission to require a strong emphasis on conservation when appropriate in all state adpoted textbooks.

The Department of Education, through the Conservation Education Service should continue and expand the studies of free and inexpensive conservation education materials begun as a part of the Advisory Committee project and should make these studies widely available to educators.

The Department of Education, through its Conservation Education Service, should encourage the production of worthwhile conservation education materials, and should encourage an emphasis on conservation in a wide variety of subject matter fields. (Section VI)

A central library and repository of conservation education materials from private conservation groups, from industry, from professional, scientific and governmental sources should be established at the state level.

SECTION II.—BASIC PHILOSOPHY AND DEFINITION OF TERMS

In all nations there is a growing awareness of the serious environmental and resource utilization problems mankind is facing—problems which must be resolved if man is to continue living on this planet. Poor land use, pollution of many kinds, and a shortage of many essential resources are only a few of the problems we have created for ourselves through past mistakes. The actions of each individual and of all groups affecting natural resources and the quality of the environment is the concern of all.

Throughout the world, population increase is matched only by the march of people into the cities. California will have almost twice as many people as today by 1990, with 90 percent of them in metropolitan areas. We not only have more people than any other state, we are also more urbanized. Under present trends, the major portion of these people will settle, at least initally, in the suburbs of existing urban regions on the state's best agricultural lands.

California's growth has been so rapid and uncontrolled that the increasing stress on our limited resources of land, air and water has made this state the world's primary battleground for restoring and maintaining the quality of its unmatched former beauty and productivity.

California may still look good to her recent arrivals. But to those who have lived here several years, the depth of change is clear indeed. Quiet streets have become snarled thoroughfares. Well-kept neighborhoods have faded into decay and disrepair. Verdant fields of alfalfa and groves of orange trees have given way to boxlike houses and acres of blacktop. Overuse of resource areas has created recreation slums that desecrate the land by the destruction of its recreation value. The air has become gray and stinky.

The contast between city pollution and ugliness and country beauty and purity is less apparent. Both cities and counties know the cost of sprawl and ugliness, the pollution of our land and landscape. The high priority problems, such as loss of open space and agricultural land to urban growth, the overuse of recreational resource areas, and air and water pollution are problems for both the city dweller and the farmer. The productivity of our forests and farms can no longer be separated from the productivity and livability of our cities.

In spite of some recognition of this basic unity of the environment, we massively tamper with the world of nature without concern for the biological results until they irreversibly force themselves upon us. The pollution of the landscape pyramids the dangers of air and water pollution as open space and open water are covered over with the slurbs and filled in with garbage. Air, chemical and water pollution move on our waters to the ocean where they threaten the life cycles of fish and the marine micro-organisms which produce seventy per cent or more of the world's photosynthetic oxygen. The loss of open space land to urbanization increases the threat to the delicate carbon-oxygen balance on which all life depends. Air pollution not only endangers all life but destroys the state's beauty and productivity. The downgrading of part of the environment inevitably affects the total.

If these facts are cause for alarm and population projections to the turn of the century are at all near the mark, the forces of economic progress will place heavier pressures on the environment—more crowding in the cities and on the highways, less unspoiled open space of woodland and shoreline, more fumes from factory and motor vehicles, more family and factory waste to be eliminated.

CONSERVATION

We define conservation as the rational use of the physical environment to promote the highest quality of living. This definition encompasses the major human concerns of this generation: the destruction of amenities, blight in our cities, pollution of our land and landscape, our air and water, loss of physical and mental health. These concerns of conservation immediately involve persons of all ages because they are the vital stuff of homes, neighborhoods, cities and countrysides. Conservation and conservation education applies to the total environment with man himself as the subject. People must come to realize that dirty rivers, polluted air, unkempt landscape need not be the price we pay for industrial progress and economic growth.

This definition places man under a moral obligation to understand the world in which he lives and to protect, enhance and make the highest use of the land and resources he holds in trust for future generations. In view of the importance in which the Committee holds the human resource, we believe that the primary goal of conservation education should be the creation of an environment in which the individual can make the highest and wisest use of his talents and potentialities. Education is charged with the primary responsibility for developing this human resource.

It is our conviction that the proper utilization of resources will secure for man the following benefits:

> A sufficiency of products to make his life useful and self-satisfying. These products enable man to fulfill his needs in respect to food, shelter, transportation, communication, and other necessities and comforts of life.
>
> An environment the quality of which will inspire the highest and wisest development of his potentialities without subjecting him to the hazards of water contamination, air pollution, excessive noise, urban crowding and other such consequences of poor resource development and utilization.
>
> An aesthetically pleasing environment in which natural and manmade beauty, historical and recreational resources are available to all.
>
> The assurance that these benefits will be available to those who will live on earth after us.

The Committee realizes that such a philosophy involves careful planning and orderly development. We do not have all the answers, but we need now to use the knowledge we have to plan for a future based on an understanding that allows for harmonious living with nature. This planning and our survival can only be achieved through education at all levels from kindergarten to retirement. The ecological principles on which man's future depends must be understood by all professions, by public and private resource management people, by politicians and employees.

Such a philosophy of development and planning for highest and wisest use implies that there are choices to be made. Who is to make these choices? We feel that all citizens should be given the opportunity to participate in this decision-making process. This calls for an electorate informed on the issues and working through government and other social institutions, to insure that the wisest possible decisions are made.

CONSERVATION EDUCATION

We define conservation education as the means of achieving an educational philosophy that will help each student develop a healthy attitude of personal responsibility toward his environment and its resources, and to provide him with the concepts, the knowledge and skills needed to contribute validly to the decision-making process on issues involving the environment and its resources. In all grade levels, environmental facts should be taught as they relate to each other, not as isolated bits of information. Children should become aware of the interrelated nature of living processes. Conservation is not an isolated subject and, therefore, cannot be dealt with in a vacuum. It deals with the scientific and long-term management of biological systems for human benefit. Conservation education requires understanding of all environmental and socio-economic systems and their relationships. Forest management and related land use, for example, can then be placed on a sound and enduring basis so that man can both use and retain his rich heritage of natural resources.

The Committee recognizes that the enlightened conservation conscience we are seeking to develop cannot be created by a single course offering, but must be developed progressively throughout the entire school experience. State law now requires conservation instruction in grades one through twelve. We would further suggest that an understanding of the interrelationships of nature be included in pre-school and headstart programs whenever possible. It is also important that conservation instruction be carried on in vocational training schools and colleges. Although the major subject areas in which conservation concepts would be stressed would be the natural and social sciences, the possibilities for integration into other subject areas should be fully exploited.

This discussion of conservation education presupposes an informed teacher. The committee recognizes one of the greatest problems in the field of conservation education today is the teacher who has little or no knowledge of the field. Therefore, we consider preservice and inservice training to be the cornerstone of any effort to upgrade conservation education.

The recommendations made here look forward to an electorate that will dedicate its efforts to healing the scarred land, protecting our great natural beauty, enhancing and preserving the amenity of neighborhoods and building balance and beauty into the cities of the future.

Massive educational programs for teachers and students, equal in weight to the present and projected assault on our resources and the quality of our environment, is the purpose of this report. There is little time remaining to solve these problems. This committee sees no miracle panacea nor technological breakthrough on the horizon. An informed public working for the common environmental good through its democratic institutions, while there is yet time, can be the only answer. Our society, our governmental structure, our environment, our community values and ambitions are only as good as we, the members of that society, choose to make them.

SECTION III.—THE SCHOOL PROGRAM

GENERAL CONSIDERATIONS

The basic goal of any conservation education program should be the development in students of an understanding of their environment and a feeling of personal responsibility for maintaining its quality. Unfortunately people often speak of conservation as something others should be doing, when really it is something everyone must practice if we are to continue living on earth with any degree of health and comfort.

One of the shortcomings of past conservation education programs was that the emphasis was placed on resources and problems far removed from the student. The farmer caring for his soil, the forester carefully managing the forest were, and still are, important concepts to which children must be exposed, but what of the student's immediate environment and his personal relationship to it?

For more than 90 percent of all Californians, "immediate environment" means an urban area. Thus, to be truly relevant to the majority of our citizens, a study of conservation must include consideration of urban as well as rural ecology. As children develop, their interests and awarenesses grow from the immediate environment of the bassinet to the home, the community, the State, the Nation, the world, and finally the universe. A child's conservation conscience should likewise develop as a part of this ever-expanding sphere of interest and knowledge. He should be shown each step of the way how he personally relates to his own environment so that he might learn to put his own ecological house in order before going forth to save the universe.

Another shortcoming of past conservation education programs was the all too common practice of studying resources as if they existed separately. For example soil, water, animals, and plants, were studied as if each existed in a vacuum. Seldom did earlier conservation studies deal with the interrelationships of resources or with the interdependencies between man and the resources. If children are to develop adequate conservation consciences, their knowledge about the world must include awareness and understanding of ecological relationships and the effect of human activities upon these relationships.

The Committee recognizes that conservation is basically a social concept. Decisions regarding man's use of the environment must be based on economic feasibility, social acceptability and political reality. The findings of the so-called pure sciences provide needed information and knowledge about the world, but decisions concerning actions to protect, utilize, and preserve the environment and its resources are a function of society and must be studied in the social sciences and humanities curriculum. Because of the possibility of controversy in dealing with social and political matters, extreme care should be used in developing conservation education programs to avoid the danger of making the classroom a "soap box" for any one point of view.

In general, then, school programs must provide conservation experiences in many subject areas throughout the entire school curriculum and in every grade level. We would hope that each graduating student will have a thorough grounding in basic ecology, resource technology and the social sciences as they relate to resource and environmental problems upon which to base a personal conservation ethic. These experiences must deal with the environment in an integrated way and must be as relevant to modern urban dwellers as to rural students. Varied programs to meet the needs of a varied population must be designed. Of particular significance in a good conservation education program is the utilization of the environment outside the classroom. Such experience need not always be of an extended "field or study trip" nature to be of value. Neighborhood nature study walks and short trips to study a local conservation problem such as a polluted stream, a badly eroded hillside, a smoking factory, or an area of urban blight can be most effective. Good examples of wise-use resource development and management should also be sought out and studied.

An extended outdoor study experience can also be a very effective part of a total conservation education program, particularly when it is closely related to the ongoing classroom activities. Such an outdoor program, among other benefits, provides children with an ecological baseline or point of reference which they will find necessary in evaluating the various environments which man has modified. Resident outdoor schools and other field study experiences should ideally include study of mountain, seashore, desert, agricultural, and urban environments. Existing programs of this type should be expanded and new ones encouraged with financial assistance from the state. A natural study area on a local school site can be a most effective conservation teaching device. A number of school districts are establishing such areas, and it is hoped that this trend will continue. Ideally such areas should be included in the master architectural and landscaping plan of a school.

Finally, an effort must be made to enable children to practice conservation throughout the entire educational process. The most elaborate and expensive program imaginable is valueless unless it creates the desired behavior patterns in children. Some suggestions to build such behavior patterns are :

Encourage children not to waste food, supplies or other materials.

Encourage children to help keep their immediate environment (school, home, neighborhood) clean, neat and attractive

Help students to discover if they might be a source of environmental pollution. If so, discuss remedies.

Encourage student organizations to participate in local environmental improvement or conservation programs.

Encourage students to contact industry, government agencies, and private conservation organizations for information on specific conservation problems.

Encourage high school or junior college science students to act as guides for nature study field trips for elementary students.

DEVELOPMENT OF THE LOCAL PROGRAM

A good school program in conservation must be integrated in all appropriate subject areas in the curriculum at all grade levels. The sciences can provide factual knowledge to help the pupil understand the complexities of the natural world, while the social sciences can provide the means to understand the political, social, and economic aspects of conservation. A study of the social sciences also helps the pupil understand the democratic processes through which individuals can work together to preserve and enhance their environment. An excellent curriculum must integrate the ideas and concepts from the various subject areas in such a way as to help each pupil fully understand and appreciate man's interrelationships and dependence on the material world. Other curricular areas such as practical arts, mathematics and language arts offer conservation teaching possibilities. In particular, the humanities should be utilized to sharpen the child's natural awareness for beauty so that he may seek to preserve and perhaps create beauty in the natural and urban environments.

In addition to the inclusion of conservation concepts throughout the regular school program, a special course at the secondary level to tie all of the various concepts together should be required for all students.

Concepts and knowldege from a great variety of subject areas should be utilized in developing conservation education units, guides, and other teaching material. The State Department of Education, colleges and universities, county and district personnel should provide the expertise required to develop such materials. A good program should include instruction about the basic principles and techniques of resource management and environmental control which will enable people to initiate and support wise environmental management activities. A close working relationship between educators and persons in positions of responsibility in resource utilization and management is essential in devising educational programs to secure these understandings.

CONSERVATION EDUCATION FRAMEWORK

A good conservation education program should be based on a conceptual framework or set of guidelines. With the increasing wealth of knowledge available today, imparting only information to students is both impractical and impossible. Effective instructional programs in any field must deal with major ideas, principles and concepts. This is particularly true in the field of conservation. Concepts provide scope and sequence, while facts and information can be chosen to suit local situations. Instructional materials can pinpoint opportunities for teaaching conservation at various grade levels and in various subject areas.

A state-recommended framework or set of guidelines should be developed by professional educators based on the concepts listed in the *Handbook on California's Natural Resources*. The Advisory Committee on Conservation Education should be retained to advise these professional educators and review the work as it progresses.

MATERIALS AND FACILITIES

The State Department of Education through the Conservation Education Service should provide leadership in developing conservation materials which are factual, current, easy to use, and adaptable to local situations. The materials would include films, books, pamphlets, pictures, charts, posters, curriculum kits and modules. The Department should also investigate and disseminate information about new technological teaching devices suitable for use in this field. Special efforts are needed to improve conservation education programs at the junior and senior high school levels. Frequently opportunities for instruction in various course areas such as science, economics, and political science are overlooked. As a result, few students graduate with an awareness of their relationship to the total environment or of their responsibilities for its care. Hopefully, as conservation instruction is improved and upgraded at the elementary school level, there will be a corresponding improvement at the secondary level.

All school districts should be assisted as needed in the establishment of planned, permanent outdoor study areas (a) on school grounds, (b) elsewhere in the district or community where and when opportunity exists. The community center type of school construction should be studied and used wherever possible. Under this concept, several local agencies cooperate in the planning and construction of a multipurpose community facility which may include a city park, library, school, city offices and other facilities. Such an arrangement permits better utilization of the buildiing and grounds than possible when each agency builds separate installations. A nature study area which could serve both schools and the community could be included in such a community center. The use of local, state, and national parks and environmental study areas should also be encouraged.

FUNDING

Funding is one of the most critical problems facing school districts in developing and implementing sound conservation education programs. Many of the best features of good programs, such as outdoor laboratories, field study trips, and resident outdoor schools, are difficult to finance under present school fiscal conditions. Funds are also necessary for inservice training programs.

Most districts find that the State contribution plus revenue raised from record high property taxes are often not enough to provide even an adequate program. It is beyond the scope of this Committee to recommend remedies for this situation, but it is agreed that all programs—including conservation—suffer from this condition.

Funds for building resident outdoor education schools authorized by Section 7951 of the State *Education Code*, might be supplied through the issuance of State revenue bonds. The bonds could be retired through funds collected from school districts for participation in outdoor education programs. Such schools could be located on public lands and be operated within the rules and regulations of the public agency concerned. It is estimated that approximately twenty years would be required to pay for such a school facility.

Local districts should be permitted to obtain additional local funds to establish and operate outdoor schools if the community so desires. Legislation enabling school boards to levy an outdoor school tax override or to submit such a proposition to the voters should be passed by the legislature.

PERSONNEL

The cooperation and active support of school administrators is essential in developing successful conservation education programs. It is important that they be included in any plans for implementing conservation education in local school districts. Their enthusiasm and support as educational leaders is essential to the success of any plans or programs. They must have the skill and knowledge to guide and support local endeavors, and must accept responsibility for providing leadership in this important curricular area.

The key person in any conservation education program is the classroom teacher. In order to help them meet their responsibilities we must:

Convince them that they are indeed the key to a successful program.
Equip them with the skills and knowledge they will need to do the job.
Provide them with the materials, equipment, and facilities they must have.

SECTION IV.—TRAINING OF TEACHERS IN CONSERVATION

PRESERVICE EDUCATION

The training of teachers is basic to any effort to upgrade conservation education. The goal in training the teacher in conservation should be the development of a well educated, sensitive, articulate person who can present all sides of conservation issues in their proper ecological and social context for, in the broadest sense, all knowledge is related to conservation. This implies that a general education rather than a specialized undergraduate program is desirable. It is also recommended that other courses in the preservice curriculum include the conservation concept where appropriate.

At least one upper division conservation course designed to tie together and summarize conservation concepts gained in earlier courses should be required for all teacher trainees. The course should include a description of the resource base available to mankind, the manner of its rational use, the alterations which occur as it is used, the limits of acceptability of these changes, the economics of resource management and the formulation of public policy. The study of the conflicts between uses and the resolution of these conflicts should form a major segment of the course. These topics should be treated in a general rather than a highly technical manner. A portion of the course content should be devoted to instruction in the techniques of teaching conservation, the preparation of curricula in this field, and a knowledge of available materials and resources (see appendix p. 41). Due to the wide acceptance of the elementary outdoor school program each elementary teacher trainee should be required to spend one week working in a resident outdoor school as a part of his practice teaching assignment.

In order to provide a thorough grounding in the principles of conservation, it will be necessary to utilize the expertise of several fields in developing such a course. For example a knowledge of the resource base involves a knowledge of geology, soil, water, air, vegetation, and wildlife. The techniques for the utilization of this base includes the areas of agriculture, mineral technology, forestry and various related industrial processes. The aesthetic and amenity values of the resource base and the economic, political, legal mchanisms through which people respond to their environment and its resources involve the social sciences and the humanities. Specialists in the education field will be needed to provide instruction in specific methods of teaching conservation.

INSERVICE EDUCATION

The Committee recommends that a massive inservice educational program be established to enable teachers to meet their obligations in the field of conservation education. These classes should cover the subject matter of conservation described above. Some of this material could be covered in field courses; either in traveling classes or at camp locations. It is important to use the natural environment whenever possible. The use of well-produced films, television tapes, and other materials would also be of great value in such an effort and should be produced at the state level.

The teachers most in need of conservation education instruction are those who have little or no interest or knowledge of the subject. A real effort should be made to reach these people. All too often the only people who take conservation education courses are those who already know quite a bit about the subject and are doing at least an adequate job of teaching it.

Other points to be considered in planning an inservice class are:

The program should be geared to the curiculum the participants will be using

The time and location must be convenient to participants

All materials and facilities should be on hand for all class sessions.

Incentives in the form of salary point credits, release time or pay should be provided. The Department of Education Conservation Education Service, county offices, governmental agencies, industry and private conservative agencies should provide leadership support and assistance for these programs.

OTHER CONSIDERATIONS

The need for college level instruction in conservation for students in all disciplines is necessary. These people will, as a group and individually, exert great influence on society throughout their careers and therefore must be aware of the need for conservation.

The Committee strongly urges colleges and universities to continue and intensify research in the field of environmental problems.

Junior colleges throughout California have a vital role to play in conservation in providing general survey courses for a great number of students and in training resource technicians. It is recommended that these two obligations be reviewed regularly and that improvements be made when and where indicated.

The Committee recommends that the short intersession courses offered on many state college campuses be used for teacher inservice training in conservation.

The Committee recommends that industry, governmental agencies and private conservation groups assist in summer conservation education workshops for teachers.

The Committee recommends that colleges and universities offer environmental education for the public in general and for school teachers in particular through evening courses, seminars, lectures, summer courses and workshops, extension courses, and correspondence courses. These can provide an effective means of reaching many people, particularly adults, for whom regular classroom instruction during the academic years is not available.

The language of SB 1 implies that there are many conservation teaching possibilities in a great many subject areas throughout the elementary and secondary school curriculum which should be utilized. The committee wishes to be sure that this point is not lost on institutions of higher education. In a survey prepared for this committee, it was determined that at least 26 areas of study offered in colleges and universities certified for teacher training in California offered courses which could be of value in providing a teacher trainee with background material in conservation. These subject areas included economics, political science, life sciences, business administration, forestry and even philosophy. Clearly concepts of conservation can and should be included in the content of many college level courses offered to prospective teachers. Nor should such instruction be limited to teacher trainees. All of society can benefit from an emphasis of this nature, as graduates so instructed assume positions of leadership in the community.

SECTION V.—THE ROLE OF THE COMMUNITY IN CONSERVATION EDUCATION

A. PRIVATE CONSERVATION ASSOCIATION

Reflecting a growing public awareness of environmental problems, a variety of private organizations are involved in the current conservation effort. They can make a major contribution to conservation education.

These organizations can be divided roughly into (1) membership groups; (2) community groups; (3) youth groups. Each group has a special emphasis and stresses a particular point of view. Each of these groups publish material of one kind or another which reflect their particular interest. Some have money to distribute their material and are in the business of doing so, but most have meager funds, publish primarily for their own membership and are hard put to supply their material upon request or even for payment. Nonetheless, there is a great wealth of conservation education material here to be utilized.

Most of this material is suitable primarily for teacher and upper-grade use. However, some groups—notably the Audubon Society—produce broad spectrum material aimed at specific grade levels as well as for adult use. It appears that there is room for development of more materials and programs on the primary levels by most conservation organizations.

Along with these organizations there are a number of individuals and groups in professions related to conservation who are interested in the educational aspect. Included are architects, landscape architects, biologists, scientists of many disciplines, artists and naturalists. Several dedicated volunteers are doing outstanding conservation work with their local school districts. There is a good deal of interest in this kind of volunteer effort among other individuals throughout the state and devoted volunteers can make a major contribution.

Youth groups, including church groups, frequently include conservation activities among their programs. Outings, tree-planting programs, and clean-up trips, often involve local school children. There is an opportunity here for these groups and the schools to work together—to the benefit of all concerned.

Other community conservation educational facilities include junior museums, nature museums, and arboretums, which are supported by interested citizens. Some schools take maximum advantage of these facilities holding classes in the museum, using available equipment and displays. Others are overlooking this kind of opportunity.

To sum up briefly, there is a wealth of material—valid and important material—being produced by private conservation organizations. There are also many interested youth and community groups and individuals who can contribute time and know how to conservation education. The questions is how best to utilize the material and talent available.

Proposed materials center

A central library and repository of conservation education materials from private conservation groups, from industry, from professional, scientific and governmental sources should be established at the state level. This would fill a great need by gathering together all the available "extra-curricular" conservation material. Such a repository would also serve as the master source for regional conservation education centers. In setting up such a library, new methods of data processing, new library procedures, and new ways to distribute material should all be explored and utilized with imagination. The material included should be national as well as local. It should be comprehensive, including audio and visual as well as graphic. It should be screened, evaluated for validity, pertinence, objectivity and usefulness. Sources should, of course, be identified. The best use of the material should be analyzed and described and should be reviewed periodically.

Broad subjects such as "water" could include everything from Save-the Bay pamphlets to a P.G. and E. brochure on rivers, from the Soil Conservation Society booklets to the National Wildlife Federation publications. Local water problems could then be studied in a broader context.

Such a library could also serve as a conservation education activities bureau—publishing a schedule of available speakers, films, field trips, meetings and conferences, at regular intervals.

A strong effort should be made to interest a major national foundation in funding this library.

Teacher education

A great deal of conservation material is published on the adult level, and is therefore suitable for use primarily by teachers and secondary students. Much of this material could be used in teacher training programs at both pre- and inservice levels.

The community and the local program

Schools should be encouraged to take every advantage of local conservation education opportunities. Local activities of private conservation organizations, youth groups, church groups, garden clubs, and professional groups, should be explored and utilized whenever possible. Museums, arboretums and other outdoor facilities (church camps, church grounds—which may also serve as outdoor laboratories) should also be used.

Informed individuals in various disciplines and talents should be encouraged to work with the district. Artists, photographers, scientists, and architects, and planners may have a great deal to contribute.

A good deal of material being published by special interest groups—from rock hounds and mycological societies to such groups as People for Open Space—is suitable for reference and use in classrooms and school libraries. Each school district should be prepared to subscribe to various publications of value which are not otherwise obtainable.

The groups involved in local conservation issues can provide usable material for class projects in science, social science, and other curricular areas. For instance, in San Francisco and Marin counties, many students became interested in acquiring land for Point Reyes National Seashore. Working with the Point Reyes Foundation, they studied the area, held cake bakes to raise money, gathered signatures for petitions and wrote letters to congressmen—an excellent exercise in social science. Such projects should be considered and explored at various grade levels.

Training in conservation and environmental concern should be developed for youth leaders such as scouts, YW and YMCA, and campfire girls. A private sector-public school cooperative program—could be set up to provide this training. Many local conservation groups could provide interesting and stimulating programs, outings, and other activities as a contribution to such a program.

In summary it may be said that much useful and valuable conservation material and talent is available from private conservation organizations, youth groups and organizations. Schools should actively avail themselves of this source of support for conservation education.

B. ROLE OF BUSINESS AND INDUSTRY IN CONSERVATION EDUCATION

The widening public awareness of conservation and environmental issues and the general acceptance of the so-called spaceship earth theory, have effectively dramatized the choices to be made in the intelligent management and utilization of our resources, from air and water to farmland and forests.

A large number of companies, particularly those in resource-oriented industries, have shown definite and growing interest in all educational processes, from kindergarten through the graduate study level. Many have offered active assistance in both delegated manpower and materials.

In another portion of this report the point is made that a good conservation education course for teachers should include a study of the relationships of resources to economics and other social factors, as well as to the policies and conflicts in human relationships. These conflicts directly involve the use and management of resources.

Therefore, private resource-based enterprise must be involved in conservation education—which we agree includes environmental education, and which we agree must begin with the conservation of the individual and his culture—if it is to remain viable.

The environmental deterioration we are facing is caused by the demands of people. More people, demanding to go more places, to have more things, to enjoy more leisure in more different ways—have produced the richest, and most prosperous, *but potentially the most catastrophic civilization* in terms of environmental destruction the world has ever known.

We are at a critical balance now and the choices we must make grow increasingly important. The conservation education program of the future must be based on the question of choices—choices between that which we must have, that which we would like to have, and that which must sometimes, however reluctantly, be judged something we do not need at all. Private enterprise must furnish honest and comprehensive information regarding these choices if intelligent decisions are to be made.

Conservation education becomes, then, not a floating burden to be assigned to a junior executive with a little time on his hands, but an item of abiding interest to the major executive who must maintain balances now, and plan for operation as far into the future as reasonably foreseen.

Conservation education deals with the entire environment. The basis for sound judgements must be widened to include economic and use criteria, as well as the more obvious and currently popular facets of recreation and aesthetics.

The Department of Education should regard business and industry as willing allies and helpers in the conservation effort. The Conservation Education Service should, as a matter of course, establish and maintain communication in depth between itself and the industrial community through responsible organizations representing both California and national industry. As proposed in Section VII, the permanent Statewide Advisory Committee will have the industrial representation, essential for such communication.

Communication

The customary time lag between the development of new industrial processes and techniques as well as discoveries in materials or applications, and their eventual appearance in textbooks and classroom must be shortened drastically or eliminated.

The communication established between the Department of Education and business and industry through the conservation education consultant's office must be a two-way street so that educators may have at least a chance to indicate what they need and want from industry and industry a chance to put the requested information in useable form that will fit within the patterns of today's schools. Once this idea is established as a workable premise, a minimum amount of regulation should be imposed so that an informal and innovative approach to information dissemination may evolve.

Many teachers now in the classroom are often unaware of the variety of sources of information available to them, and all-too-frequently they overload the sources they do know about with repetitious or misdirected inquiries such practices result in a great waste of time and money. Conversely, industry frequently must fumble with a series of inquiries before it can analyze the situation and develop usable materials and services for educators.

The permanent Statewide Advisory Committee on conservation education as proposed in Section VII should be established without delay and should include as an early priority establishing guidelines which permit the classroom teacher to work more effectively with industry obtaining worthwhile information, materials and services. A similar broad and non-limiting arrangement should be set up and kept current to give the business and industrial communities a basic insight into the needs of teachers.

C. THE ROLE OF RESOURCES-ORIENTED GOVERNMENT AGENCIES IN THE SUPPORT OF CONSERVATION EDUCATION

While the statutory authority to provide statewide leadership in conservation education lies with the Department of Education, the Resources Agency of California, along with federal resources-oriented agencies operating in California, should seek to provide technical support to educators, drawing upon the expertise of the people in these agencies. There exists an agreement of cooperation between the Resources Agency of California and the State Department of Education, signed first in 1963 and then reaffirmed by a new agreement on July 5, 1967 which clearly delineates these responsibilities.[1] To extend the quality of such assistance and to coordinate activities with the various agencies of the United States government in California, there has been organized a State-Federal Resources Information and Education Officers Council which has been meeting since December, 1967. Membership on the council includes, from the State Resources Agency, representatives of the Departments of Conservation, Parks and Recreation, Fish and Game, Water Resources and the Water Resources Control Board; and the State Department of Agriculture.

From the federal agencies there are representatives of the following organizations: Army Corps of Engineers, Fish and Wildlife Service, Forest Service, Bureau of Land Management, Soil Conservation Service, National Park Service and the Bureau of Reclamation. In addition to the representatives of Federal and State resource agencies, a representative of the California Department of Education regularly attends the meetings and participates in the work of the group as an ex officio member of the council.

As the various agencies recognize the increasing importance of their role in conservation education, it is expected that the demand for services and materials will increase and therefore the agencies will have to increase their budgets for these functions.

Through interagency cooperation and with the direction and assistance of the Department of Education, duplications and materials and services can be eliminated and the net effect will be a much more efficient and effective program.

State and Federal agencies

Public agencies at the state and federal levels, particularly those managing large areas of public lands, such as the U.S. Forest Service, National Park Service, U.S. Bureau of Land Management and the State Department of Parks and Recreation, State Division of Forestry and State Lands Commission should prepare informational material designed to inform educators and students of the value of public lands as educational resources for field trips, and outdoor education centers, and make land available for this purpose. For example, the California Department of Parks and Recreation and the Department of Education could jointly construct and operate resident outdoor schools at various locations in State parks throughout California. The Department of Education could be responsible for the educational staff and instructional program, while the Department of Parks and Recreation would supply information, interpretive services, and operate the physical plant facilities. A unit cost to cover operating expenses for the facilities and permit loan repayment would be set up, and school districts would be permitted to send students upon payment of the established weekly unit cost. Initial development funds for facilities could be provided by sale of revenue bonds.

Similar programs, similarly financed, could be developed with all federal and state agencies operating in California to make outdoor areas under their control readily available for outdoor education purposes.

Study kits emphasizing the methods and techniques of the historian could be developed by agencies managing historical facilities. For example, a kit containing facsimile documents, pictures, drawings and other materials could be prepared for Sutters Fort. Questions could be prepared which could be answered by careful study of the materials in the kit and a visit to the Fort. Conflicting or unrelated information could be introduced to provide students with an opportunity to make judgments based on a careful study of available information.

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[1] Appendix.

Field trip procedures and policies differ widely among the various school districts. The lack of uniform procedures in making reservations, and pupil preparation creates problems for resources management personnel offering field trips. It is proposed that the Conservation Education Service of the Department of Education develop a set of guidelines for pupil-teacher planning and conduct on field trips which could be printed and distributed by the Department of Education.

A simple guide suggesting pre-visit studies, on site investigations, and follow up activities for teacher-use should be available for all field study areas used by students. It is suggested that the Conservation Education Service prepare an outline for the development of such a guide to assist management personnel in preparing material locally. One or two sample guides could be developed jointly to serve as examples.

Local resource management personnel should be helped to examine their educational activities to determine if they are making the most effective use of their personnel. It is suggested that teacher training and curriculum consultation, for example, is a better use of resource personnel time than conducting student tours when the students are inadequately prepared or supervised.

The California Department of Parks and Recreation is developing a mobile unit to help students gain a better understanding of California history. It is proposed that the Department of Education offer all possible assistance on this project.

Continuing liaison between the Department of Education and all federal and state land management agencies is necessary and should be maintained. Financing and staffing of public resource agencies and the Department of Education to meet the increased demands for educational assistance that can be expected as a result of the conservation requirements of the *Education Code* should be provided by the Legislature for state agencies. Federal agencies should receive budgetary support from the Congress for their activities in the educational field.

The Committee recommends that the California Resources Agency coordinate all of its activities in the conservation education field through the office of the Chief of Conservation Education. The person assigned to this position should work closely with the conservation education consultant in the Department of Education.

The Committee believes that the State-Federal Resources Education and Information Council should be augmented as needed and continue its work of coordinating the efforts of the various agencies, and that the Department of Education continue to cooperate with this group through its conservation education consultant.

SECTION VI.—CONSERVATION EDUCATION MATERIALS

The conservation instruction mandate contained in Senate Bill 1, has vastly increased the already critical need for high quality graded conservation education materials for all levels and all areas of the education system of California. The needs for quality curriculum materials are magnified by (1) inadequate teacher preparation and consequent low level of interest in conservation; (2) diversity and difficulty of locating sources of graded materials; (3) the time and dollar costs of gathering materials; (4) the competition of other requirements and interests; (5) the limited knowledge and interest in conservation of most leading authors in most fields; (6) the failure of some conservation-oriented authors to link their conservation interests with their major academic discipline; (7) the failure of the Curriculum Commission to include conservation in its specifications and to utilize conservationists in textbook evaluation; and (8) the approach of Senate Bill 1 which is based upon integration of conservation education with other disciplines rather than treating it as a discrete element in the curriculum. These considerations create a need for the inclusion of conservation concepts and content in most of the textbooks used in the State and pose at least as many and as serious problems for authors as for classroom teachers and administrators.

To assist in correction of these conditions three studies were made of the availability and quality of conservation education materials used in or available to California schools and teachers. These studies are:

"An Analysis of State Adopted Textbooks Relative to Conservation Education Information" (completed June 1967)

"An Analysis of Audio-Visual Materials Relative to Conservation Education" (Produced by the Los Angeles City Schools under contract with the California Department of Education, January, 1969)

"Evaluated Bibliography of Free and Inexpensive Conservation Publications" (Produced by Los Angeles County Schools under contract with the California Department of Education, May, 1969)

This report is based on these studies plus a study of the materials evaluated.

TEXTBOOKS

Basic textbooks are the most seriously deficient of all curriculum materials in conservation concepts and content. This is completely expectable because:

The Curriculum Commission criteria do not include conservation elements.

Most authors have little or no knowledge of or interest in conservation.

Many conservation-oriented authors fail to connect this interest with their major discipine, particularly if they are in the humnaities, social sciences, or physical sciences.

Some conservation-oriented authors deliberately abstain from inclusion of any conservation elements and interrelations with other fields on the grounds that such materials are either out of place or dilute the major subject content of their books.

Some conservation-oriented authors include conservation elements in their books but carefully avoid use of the term which causes the value of the conservation materials to be lost to all but strongly involved and experienced teachers.

In most science texts investigations, problems, and projects are even more deficient in conservation significance than the instructional text portions of the books. Several books ostensibly directed toward enlightening pupils about man's environment devote inordinate amount of time to outer space. Man's active environment will quite likely include at least a considerable portion of the solar system some day, but that time is in the future and most people know far too little about their present environment to live in and use it properly. Therefore, units on outer space should be continued but scaled down to a less dominate portion of textbooks that are supposed to be oriented to man's earth environment. Illustrations with conservation value are lacking in most books, and captions are even more deficient in pointing up the conservational aspects of illustrations which contain such content. The poor quality of illustrations in some texts, failure to connect illustrations only because it is usually done compound the illustrative deficiencies of textbooks with regard to conservation.

In order to in some measure correct these deficiencies, the Committee recommends that the State Board of Education require that:

The Curriculum Commission criteria include the integration of conservation concepts and content in all basic and supplementary textbooks in appropriate disciplines with used of the term "conservation" in such contexts.

Authors and publishers be adequately informed of this criterion.

The conservation education consultant to the State Department of Education and members of the Conservation Education Advisory Committee or conservationists approved by the Committee be included on panels of consultants for evaluation of textbooks. It should also be noted that the services of the California Resources Agency are available for consultation on the technical aspects of resource management.

Instructions to evaluators include criteria on illustrations and captions.

CURRICULUM MATERIALS

Curriculum materials for conservation are the most deficient at the elementary and intermediate grades because of the widespread attitude, among conservationists as well as others, that conservation is an "adult" field reserved for the mature, highly trained specialist in science, technology, or occasionally economics. Awareness of the need to begin to build conservation knowledge, understandings, appreciations, and habits at the earliest possible age has only recently been recognized by more than a handful of conservationists and educators and is still very limited. As a result there is relatively little quality graded material in conservation available for use below the secondary level and virtually none for the kindergarten and pre-kindergarten levels where the foundations for a conservation ethic must be laid.

The Committee recommends that the State Board of Education through the Conservation Education Service take action to encourage producers and suppliers of curriculum materials to develop quality graded materials for the pre-kindergarten to intermediate levels. Such action might be both direct—by publicity concerning the need and by revision of Curriculum Commission and other evaluative panels' criteria—and indirect by the State Department of Education and/or the Advisory Committee.

CONSERVATION AND THE HUMANITIES

Humanities curriculum materials tend to be the most deficient in conservation emphasis and those used in the social sciences only somewhat less so. This is due to the traditional isolation of the humanities and social sciences from any consideration of the natural environment and the environmental related physical, earth, and life sciences. Similar deficiencies occur in curriculum material used in the physical, earth and life sciences which have traditionally disregarded the interrelationships and interaction of these fields with the humanities and social sciences.

The Board and Department of Education has the responsibility to acquaint authors and publishers of the necessity for including references to conservation and to the interrelationships and interaction of these several fields in all curriculum materials. Such action might include:

Obtaining support of the State Department of Education for authors' workshops and other activities under its auspices.

Actively enlisting the cooperation of the institutions of higher education in California to present courses, workshops, institutes, exhibits, and other activities for educators and authors.

Including these elements in Curriculum Commission and other evaluative panel criteria.

AUDIO-VISUAL MATERIALS

Among audio-visual materials with conservation education value, too little has been done to develop and utilize media materials such as three-dimensional models, simulation models, stereo-photographs, multi-media and multi-screen and audio materials with conservation value.

Producers of audio-visual materials should be encouraged by direct and indirect means to make fuller utilization of these technological innovations in producing materials suitable for conservation instruction.

RESOURCE ECOLOGY EMPHASIS

When available curriculum materials contain conservation concepts and content their approach and concept of the term tends to be narrow and mechanistic. Conservation is too often presented as either the simple application of science via technology, as nothing more than resource use, or as a purely economic problem. This leads to inadequate consideration of cause-effect relationships; disregard of the fact that actions which are beneficial in the short run are sometimes harmful over longer periods of time; slighting or completely ignoring the interrelations, interactions, and interdependence of man and his resources. The consequence of this is that the ecology of resources is passed over or ignored completely.

USE OF THE TERM CONSERVATION

Presentation of conservation concepts and content is often so vague that only an experienced and conservation-oriented teacher can recognize them. Evaluators of curriculum materials adopted or recommended by the State Board should ensure that conservation concepts and content are clearly presented and identified as such. Evaluation panels should include conservationists approved by the Conservation Advisory Committee in order to implement this recommendation. Producers of free and inexpensive materials and other items not subject to statewide review should be encouraged through the Department of Education Conservation Service to present conservation concepts and content clearly with use of the term in appropriate contexts. Such material should be reviewed and updated periodically.

FACTUAL AND CONCEPTUAL ACCURACY

Errors of approach and concept appear too often. These include presenting as strong possibility or even established fact that (a) man can control nature (b) that science and technology can provide all of the needed solutions to conservation problems (c) that resource use constitutes conservation and (d) that change and progress are identical. The Curriculum Commission and other evaluative panels should require correction of such errors just as they require correction of content errors in other fields.

FREE AND INEXPENSIVE MATERIALS

Supplementary texts, audio-visual materials, and free and inexpensive materials as a whole present conservation concepts and content more effectively than do most textbooks in the life and social science fields. Unfortunately a large proportion of the free and inexpensive materials are ephemera in that supplies are exhausted and replaced by new items long before their value has ended. This creates problems for potential users of materials and therefore inhibits effective teaching of conservation. Producers of such materials should be aware of these problems and should seek to produce materials of sufficient quality and in sufficient quantity to permit their use in educational programs over a reasonable period of time.

Suppliers of free and inexpensive materials are widely dispersed and highly specialized. This makes it very difficult and costly for the classroom teacher to locate needed materials.

A series of conservation materials centers as recommended in Section V would help to remedy this situation.

SECTION VII.—THE ROLE OF THE DEPARTMENT OF EDUCATION IN CONSERVATION EDUCATION

A basic premise underlying all of the deliberations and study of the Advisory Committee has been that the Department of Education is legally and morally obligated to assume a strong role of leadership in the conservation education program of the State of California. The Committee recognizes six provisions of the *Education Code* and a joint Departmental policy statement as delineating this leadership role.

Education Code Sections[1] 8503, 8551–c, and 8571–b require that adopted courses of study provide for instruction in the protection and conservation of resources and in man's relations to his human and natural environment at appropriate elementary and secondary grade levels and subject areas.

These sections were enacted by the legislature in 1968 as a part of the Miller Senate Bill 1, a major *Education Code* revision. Prior to the passage of Senate Bill 1, the only legal requirement of conservation instruction was that Conservation, Bird and Arbor Day should be observed in the schools with appropriate educational activities. (*Education Code* 5205)

The Rafferty-Livermore Statement of July 5, 1967 pledges the Department of Education to assume a role of statewide conservation education leadership and pledges the Resources Agency to provide support and technical assistance for such a program. (See appendix for complete text)

Education Code 363.5 and 6011.5, passed by the Legislature in 1968 (Senate Bill 206, Moscone and Marks) created a Conservation Education Service in the Department of Education and empowers the Department to make planning grants to local districts for conservation education programs. Legislation to fund these operations was introduced in the 1969 session (Senate Bill 1392, Moscone) but died in Committee.

HISTORY

Previous Conservation Efforts

For many years a consultant in the Bureau of Elementary and Secondary Education was assigned to devote ten per cent of his state support time to conservation education. The Bureau of Health and Physical Education also shared some of the conservation education work load by accepting responsibility for outdoor education. Responsibility for conservation education and outdoor education was assigned to the Title V Conservation Education Project in January 1968.

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[1] Appendix.

A great amount of assistance in the educational program was, and still is, rendered by the Resources Agency and the Department of Fish and Game. Both of these organizations have specific state supported conservation education positions. Several other state agencies have combined education and public information positions.

An interdepartmental conservation education committee was established some years ago in an attempt to coordinate the activities of the Department of Education and the Resources Agency. Later, separate Resources Agency and Department of Education committees were set up with the chairman of each serving as an ex officio member on the opposite committee. The Resources Agency committee meets regularly but the Department of Education committee has not met since the retirement of its chairman in 1968.

Senate Hearings

On March 16, 1966 the Senate Fact Finding Committees on Education and Natural Resources met jointly to consider the topic "A Program of Conservation Education for the Department of Education." The hearing established that the program currently offered was far from adequate and that planning was needed to set up legislative and administrative guidelines essential to its improvement.

Asilomar Conference

On July 9–11 a conference for this purpose was held at Asilomar. Members and staff personnel of the two senate committees, educators, industry representatives and conservationists participated. A report covering this conference was printed by the Department of Education. The Advisory Committee has studied this report in detail and has used it as the basis for several of their recommendations.

Advisory Committee

In May, 1967 the State Board of Education activated an Advisory Committee consisting of representatives of industry, government, education and private conservation agencies to study in detail the problems identified by the Senate Committee and the Asilomar Conference and to make specific recommendations for solving them. A specialist was employed in January of 1968 to serve as executive secretary to the Committee and as a conservation education consultant in the Department of Education. All Committee operations and the consultant position were, and are currently, funded through an Elementary and Secondary Education Act, Title V grant.

Handbook on California's Natural Resources

In September, 1968 the publication *Handbook on California's Natural Resources* was printed by the Department of Education and offered to the schools. The ninety-six page volume contained educational concepts of conservation and detailed information on specific resources. By December the entire 15,000 copies were gone. Back orders for several hundred copies are on file in the Department. A revised edition is being planned with the cooperation of the Resources Agency. The Department of Education will, if funds can be found, print the educational material while the Resources Agency will print a companion volume containing specific information on the resources.

CONSERVATION EDUCATION SERVICE

The state legislature and the Governor have clearly established a conservation education policy.

Thus far, funds have not been made available to implement these policies. *If it were not for temporary Federal financing, there would be no program at all in the Department of Education.*

The Committee considers implementation of the Conservation Education Service in the Department of Education with adequate funding and personnel, to be imperative. One consultant position with adequate support is considered a bare minimum. The Committee urges the Board of Education and the Department of Education to actively seek funding for this purpose.

Areas of responsibility

The Committee recommends that these specific subject areas be the responsibility of the Conservation Education Service:

1. Resource use education (wise use of natural and human resources).
2. Environmental education (protection and enhancement of the common environment).
3. Outdoor education (use of the out-of-doors on a short term or extended basis as a part of the conservation education program).
4. Conservation teaching methods, techniques, materials and teacher training.

These services should be offered by the Conservation Education Service:

Provide consultant services to school districts in conservation and outdoor education as requested.

Arrange for the review of new books, films, free and inexpensive publications and other related conservation materials.

Keep the schools informed as to the latest in teaching materials.

Provide leadership in the inservice training program.

Study and report on outstanding conservation education projects in operation throughout the state.

Prepare annual Conservation Week mailings for all California schools.

Develop conservation materials, guides and reports as needed using part-time consultants when necessary.

Attend and participate in conferences and meetings relating to conservation education.

Assist institutions of higher learning in their preservice and inservice conservation education programs.

Work with representatives of government agencies, industry and private conservation groups in planning and directing programs of conservation education.

Perform other related services and responsibilities as appropriate.

In the future, the Conservation Education Service should be elevated to bureau status within the Department of Education. This unit would be headed by a Bureau Chief to serve as an overall administrator and would include:

A conservation education teaching methods service to develop practical teaching materials, demonstration equipment, films, courses of study and other services.

A publication service providing bibliographies of available material and developing and printing materials as needed.

A teacher training section to work with colleges and universities, county offices and local school districts in developing and conducting preservice and inservice programs.

Regional and national cooperation

There is very little communication or cooperation between the various state departments of education on conservation education matters.

If we agree that conservation education is a regional as well as a national problem, an effort must be made to remedy this situation. Such communication would be mutually beneficial to all participants because it would facilitate:

The exchange of ideas, materials and plans between the states.

The development of cooperative projects of benefit to all participants.

The development of a more unified approach to a study of environmental and resource use problems.

The establishment and encouragement of new programs in states lacking them.

It is recommended that the State Department of Education through its Conservation Education Service, seek funding to sponsor a regional conservation conference for state department of education representatives from Oregon, Washington, Idaho, Arizona, Nevada, and Utah. The purpose of this conference would be to permit participants to study in detail the conservation education efforts of other states, and to discuss possible means of cooperation, and to explore the possibility of setting up a national cooperative effort through the U.S. office of education.

The Committee recommends that funds for this conference be sought from private industry, conservation associations or foundations, or through a federal grant.

Conceptual framework

The *Education Code* indicates that conservation is to be taught in appropriate grade levels and subject areas, grades one through twelve. It is also specified that man's relations to his human and natural environment shall be a part of the social sciences program in grades one through twelve. In order to provide such instruction, a guide showing how basic conservation concepts may be taught in various subject areas and at various grade levels must be produced to assist local districts in developing programs suited to local needs. This is particularly important if the conservation implications inherent, but not properly emphasized in the proposed Social Services Framework are to be adequately covered.

Other publications

It is recommended that the Board and the Department of Education arrange for the printing and distribution of the following publications produced as part of the studies of this Committee.

Evaluated Bibliography of Free and Inexpensive Conservation Publications (Approximately 2,000 copies for distribution to county offices and local school districts).

An Analysis of Audio-Visual Materials Relative to Conservation Education (Approximately 2,000 copies for distribution to county offices and local school districts).

Advisory Committee Report (Approximately 2,000 copies to fill requests from schools, governmental agencies, industry, conservation groups and interested citizens).

Since a considerable amount of time and money have been expended in the production of these publications, failure to produce them and place them where they can be used would constitute a waste of public funds.

Outdoor education guide

Since many school districts are planning to set up resident outdoor education programs, a guide providing information on land acquisition, site development, design and construction of facilities, the instructional program, and the legal aspects of the program would be most valuable. It is recommended that the Department of Education through its Conservation Education Service develop such a publication.

ADMINISTRATIVE ORGANIZATION FOR CONSERVATION EDUCATION

Advisory Committee

The Committee recommends that a permanent advisory committee be established by the State Board of Education to facilitate communications between educators and the various areas of conservation interest. Such a committee will provide the Board and the Department of Education with the services of experts in the field of conservation education and will also provide a means of communication with schools. It is recommended that this committee meet twice yearly to review the programs and planning of the Conservation Education Service and bring to the service, progress reports and program plans from the schools and from the various areas of conservation interest. It is suggested that membership be drawn from the following areas:

Colleges and universities;
General interest citizen groups;
Museums and research organizations;
Federal and State resource agencies;
Teachers organizations;
Citizen conservation groups;
Industry;
State government (an elected official such as the Lieutenant Governor or a legislator);
County office representatives (one representative from each of six major regions as set up by California Department of Education, Bureau of Reference Services).

A maximum of twenty members for the committee is recommended. Appointments should be made by the Board of Education upon the recommendation of the Department of Education and would be for a two-year period.

The six county office representatives would be chosen to represent their particular geographical area on the statewide committee. They would be responsible for contacting representatives in all county offices in their areas so that two-way communications may be set up between local school districts and the statewide committee.

In the diagram shown on page 40 the statewide Advisory Committee is shown reporting directly to the Board of Education. As a practical matter, we would recommend that the Conservation Education Service be delegated the responsibility of working with this group.

Department of Education Staff Conservation Education Committee

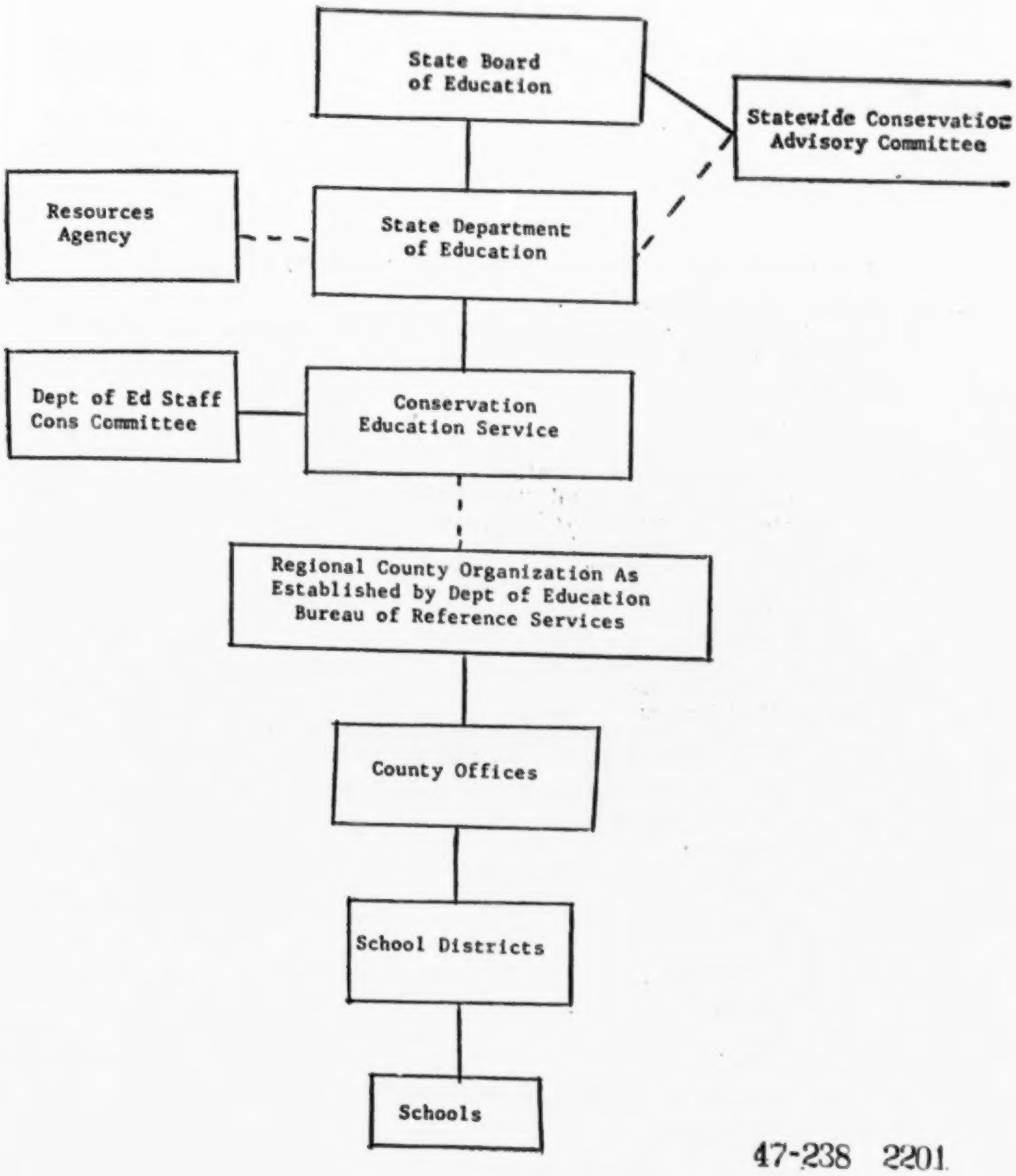
This group consisting of representatives of the Bureau of Audio-Visual Education, the Bureau of Health, Physical Education and Outdoor Recreation, and the Bureau of Elementary and Secondary Education has not met since the retirement of its chairman in September 1968. It is recommended that this committee be reactivated and the conservation education consultant named as its chairman. The committee membership should be expanded to include membership from these areas of conservation interest:

School planning;
Agricultural education;
Elementary and Secondary Education consultant in science and social sciences.

Other appropriate specialities should also be included on this committee when required. A representative of the Resources Agency should serve as an ex officio member of the committee.

The diagram on page 40 shows an organization through which the Conservation Education Service may be placed in direct contact with all schools and areas of conservation interest on a two-way basis. You committee recommends that such an organization be set up by the Department of Education as soon as possible. Both materials and information may be passed through such a network. It is suggested that meeting agendas and minutes of Advisory Committee meetings be distributed to school districts and country offices through this communications arrangement.

ADVISORY AND COMMUNICATIONS NETWORK
CALIFORNIA DEPARTMENT OF EDUCATION
CONSERVATION EDUCATION ADVISORY SERVICE


State Board of Education
Statewide Conservatio
Advisory Committee
Resources Agency
State Department of Education
Dept of Ed Staff Cons Committee
Conservation Education Service
Regional County Organization As Established by Dept of Education Bureau of Reference Services
County Offices
School Districts
Schools

AN OUTLINE FOR A COURSE ON CONSERVATION FOR PRESERVICE OR INSERVICE TRAINING OF TEACHERS

The course outline is intended to be a guide to the content of a course in conservation taught at the university and college level. It is recognized that the course may have to be taught by a team of three to four instructors. The expertise necessary to cover the broad range of the conservation topic is not always present.

As presented in the outline, the course would consist of twenty-seven lectures over a quarter or semester period. Thus it should be a five unit course. It would be best taught with one field or laboratory session each week in which the contents of that week's lectures were observed in field situations.

Insofar as the course is predominantly for teachers, it should include throughout the course, comments on how the material should be taught. The field laboratories could also emphasize this. There is in the last two lectures a discussion of teaching conservation.

A partial bibliography is attached for the use of instructors of the course. All of these books are in the Library of Forestry and Conservation at the University *of California in Berkeley*.

It is hoped that this course will be taught in exhilarating enough style that it it will be taken by students out of a desire to learn the material and not because it may be required. The subject matter is such that it relates to everyone.

CONSERVATION

A suggested course outline for preservice training of teachers

- *I. Introduction (two lectures)*
  - A. Definition of Terms
    - 1. Conservation
    - 2. Resources
    - 3. Environment
    - 4. Ecology
    - 5. Etc.
  - B. Historical Aspects of Conservation
    - 1. Development from primitive societies
    - 2. Conservation problems of the past
    - 3. Recent historical development
  - C. Current Scope of Conservation
    - 1. Resource and environmental factors
      - a. Physical
      - b. Biological
      - c. Amenity—Aesthetic
    - 2. Economic factors
    - 3. Political factors
    - 4. Interrelations between education and conservation
  - D. Examples of Present Day Conservation Problems and Issues
- *II. Resource and environmental factors in conservation (five lectures)*
  - A. Physical Resources and Environment
    - 1. Atmosphere
    - 2. Hydrology
    - 3. Energy
    - 4. Geology
    - 5. Soil
  - B. Biological Factors
    - 1. Microbiological
    - 2. Vegetation
    - 3. Animal
    - 4. Human
- *III. Processes relating resources and environment (four lectures)*
  - A. Energy Exchanges
    - 1. Energy balance
    - 2. Productivity related to energy
    - 3. Fossil energy

- B. Hydrologic Exchanges—The Hydrologic Cycle
  - 1. Precipitation
  - 2. Water yield
    - a. Runoff and erosion
    - b. Floods and flood control
  - 3. Water use
    - a. Vegetation and crops
    - b. Industrial and urban
    - c. Water quality and pollution
- C. Elemental Cycles
  - 1. Nitrogen
  - 2. Carbon
  - 3. Other elements
  - 4. Cycling of undesirable material
    - a. Natural examples—toxic elements, salinity
    - b. Newly synthesized materials

IV. Ecology and ecosystems (two lectures)

- A. Interdependence of Organisms and Environment
  - 1. Food chains
  - 2. Tarnsfer of materials between organisms
  - 3. Environmental limits to survival
- B. The Human Ecosystem
  - 1. Position of man
  - 2. Physical relations (temperature, water, etc.)
  - 3. Nutritional relations (mineral, organic, energy)
  - 4. Mental health—relations
    - a. Aesthetic—amenity aspects of environment
    - b. Sociological environment
  - 5. Demographic relations

V. Resource use by man (six lectures)

- A. Processes of Use
  - 1. Mining
  - 2. Agriculture
  - 3. Forestry—range management
  - 4. Wildlife and fish harvest
  - 5. Power and energy development
  - 6. Urban and industrial siting and development
  - 7. Landscape amenity and aesthetic use
- B. The Conservation Landscape
  - 1. Compatibility of uses
    - a. Exclusive uses
    - b. Blending resource use
  - 2. Exclusive use areas
    - a. Mining
    - b. Wilderness parks
    - c. Urban
  - 3. Multiple use areas
    - a. Managing for compatibility
    - b. Conflicts between uses
  - 4. Environmental Quality Maintenance
    - a. Air pollution
    - b. Water pollution
    - c. Erosion
    - d. Landscape quality
    - e. Sound and noise
    - f. Others

VI. Social and Political Aspects of Conservation (three lectures)

- A. Conservation Economics
  - 1. Supply and demand for resources
  - 2. Economic priorities
  - 3. Rare and unique resources
  - 4. Economic criteria in conservation decision making

- B. Politics of Conservation
    - 1. Human conflicts in conservation
        - a. Local interests versus distant interests in specific areas
        - b. Individual versus group interests
        - c. Resolution of conflicts
    - 2. Governmental organization for conservation
- C. Conservation law

VII. Case Studies (three lectures)

- A. Worldwide Conservation Problems
- B. National
- C. Local

VIII. Case Studies (three lectures)

- A. Course Content at Various Grade Levels
    - 1. Pre-school
    - 2. Elementary
    - 3. Secondary
    - 4. High School
- B. Conservation Education Materials and Sources
- C. Conservation Field Trips
    - 1. Organization
    - 2. Local facilities
    - 3. Fixed field facilities
- D. Conservation News
    - 1. Identification of current problems
    - 2. Relation of individual interest to problem
    - 3. Identifying conflicts and special interests

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EXCERPTS FROM CALIFORNIA EDUCATION CODE, 1968 SUPPLEMENT RELATING TO CONSERVATION INSTRUCTION

CHAPTER 3. DEPARTMENT OF EDUCATION

Article 1. General provisions

Conservation Education Service

363.5. There is hereby created a Conservation Education Service in the Department of Education. The Conservation Education Service shall encourage the development of educational opportunities specifically related to the conservation, the interpreation, and the use of the natural resources of the State of California, including but not limited to, the development of nature centers, the development of conservation and wildlife education camps, and the development of the educational curriculum in relation to the conservation of natural resources. (Added by Stats. 1968, Ch. 978.)

Article 3. Course of study for grades 7 through 12

Areas of study

8571. The adopted course of study for grades 7 through 12 shall offer courses in the folowing areas of study:

(a) English, including knowledge of and appreciation for literature, language, and composition, and the skills of reading, listening, and speaking.

(b) Social sciences, drawing upon the disciplines of anthropology, economics, geography, history, political science, psychology, and sociology, designed to fit the maturity of the pupils. Instruction shall provide a foundation for understanding the history, resources, development, and government of California and the United States of America; *man's relations to his human and natural environment*; eastern and western cultures and civilizations; and contemporary issues.

Articles 2. Course of study for grades 1 through 6

Areas of study

8551. The adopted course of study for grades 1 through 6 shall include instruction, beginning in grade 1 and continuing through grade 6, in the following areas of study:

(a) English, including knowledge of, and appreciation for literature and the language, as well as the skills of speaking, reading, listening, spelling, handwriting, and composition.

(b) Mathematics, including concepts, operational skills, and problem solving.

(c) Social science, drawing upon the disciplines of anthropology, economics, geography, history, political science, psychology, and sociology, designed to fit the maturity of the pupils. Instruction shall provide a foundation for understanding history, resources, development, and government of California and the United States of America; *man's relations to his human and natural environment;* eastern and western cultures and civilizations; and contemporary issues.

Conservation education

6011.5. The State Superintendent of Public Instruction, upon the recommendation of the Conservation Education Service, is authorized to make planning grants to individual school districts, or groups of school districts, or to unified school districts to assist such school districts in determining the feasibility of programs and classes in conservation education and the feasibility of the maintenance of outdoor education camps and projects for such purposes. (Added by Stats. 1968, Ch. 978.)

Instruction in personal and public health and safety

8503. The adopted course of study shall provide instruction at the appropriate elementary and secondary grade levels and subject areas in personal and public safety and accident prevention; fire prevention; the *protection and conservation of resources;* and health, including the effects of alcohol, narcotics, drug, and tobacco upon the human body.

Conservation, bird, and Arbor day

5205. March 7th of each year, the anniversary of the birthday of Luther Burbank, is set apart and designated Conservation, Bird, and Arbor Day.

All public schools and educational institutions shall observe Conservation, Bird, and Arbor Day not as a holiday, but by including in the school work of the day, suitable exercises having for their object instruction as to the economic value of birds and trees, and the promotion of a spirit of protection toward them, and as to the economic value of natural resoures, and the desirability of their conservation.

CONSERVATION EDUCATION IN CALIFORNIA

A JOINT POLICY STATEMENT ISSUED BY THE CALIFORNIA DEPARTMENT OF EDUCATION AND THE RESOURCES AGENCY

California's abundant, varied and productive natural resources have given its citizens a way of life that is envied worldwide. The successful continuance of this way of life depends basically on how we conserve, manage and utilize the resources that remain.

Such wise management and utilization requires the intelligent cooperation of the enterprising private sector involved in basic utilization of our natural resources and the elements of State government charged by the people with administering the public resources management and protection program.

Basic to this intelligent cooperation is an informed public that understands and is able to make sound judgments as to the continuing quality of the resources management program. To develop an informed public we must depend upon education to provide citizens with a broad understanding of the importance of a balanced resources management program in the State.

It is essential that teachers of the State receive adequate training in the fundamentals of natural resources conservation, and that every student receive careful instruction in this vital subject.

To obtain this objective, we, the Superintendent of Public Instruction and the Administrator of the Resources Agency of California, agree to coordinate our efforts, under the leadership of the Department of Education, in the development of an accelerated program of conservation education in teacher training and in classroom instruction at all levels, designed to have far reaching beneficial effects on the moral, physical and economic status of California's citizens.

MAX RAFFERTY,
Superintendent of Public Instruction.
N. B. LIVERMORE, JR.
Administrator of the Resources Agency.

STUDIES COMPLETED AS A PART OF THE ADVISORY COMMITTEE PROJECT

1. *An Analysis of Audio-Visual Materials Relative to Conservation Education.*
2. *An Analysis of State Adopted Textbooks Relative to Conservation Education Information.*
3. *California Conservation Education Survey.*
4. *Evaluated Bibliography of Free and Inexpensive Conservation Publications.*
5. *Natural and Human Resource Conservation Courses Offered to Prospective Teachers in California.*
6. *Report on Conservation and Outdoor Science Education in California.*

TO THE ADVISORY COMMITTEE ON CONSERVATION EDUCATION

From the California State Board of Education

"Man is the only organism that lives by destroying the environmental indispensable to his survival" declared William Vogt in 1948. That sounds like a sentence of death.

However, the State Board of Education does not feel hopeless and it has called you together to help us do our part in providing more enlightened attitudes towards the relationship between man and his environment, from the interior of his planet Earth to outer space. More effective instruction in this area will bring into focus modern areas of concern and enable man to make wise choices concerning his total world.

Education must bear its share of the responsibility for the discovery of new ideas and approaches and the implementation of a program broad enough to include a comprehensive study of all those external conditions and influences which man must successfully manage or adjust to if he is to keep man's "house humanly habitable."

As a first step, the Board is asking its Advisory Committee to determine how much of a program of in-service teacher education and dissemination of information about conservation education there has been in the past and how it has been financed—a status report if you will. Of course the committee should review pertinent documents and findings included in the State Board financed Planning Conference report, the report of the Joint Senate Fact Finding Committees, (1) and the Fourth Progress Report to the Legislature (2).

1. Planning Conference Report:———ation and Natural Resources. Report of Joint Hearing, Senate Fact Finding Committee on Natural Resources and Senate Fact Finding Committee on Education on "A Program of Conservation Education for the Department of Education," March 16, 1966.
2. Fourth Progress Report to the legislature 1967 Regular Session, Senate Permanent Fact Finding Committee on Natural Resources, Section II.

The committee should also review reports and presentations from individuals and organizations concerned, including the Interdepartmental Committee on Conservation Education. It should request and review reports from the Statewide Advisory Committee on Science Education and the State Social Sciences Study Committee on the role of conservation education in the frameworks being prepared.

The Board requests the following lines of inquiry as taken from its planning conference report, that:

(1) An analysis be secured, perhaps by a small ad hoc group, of all state adopted texts relative to the conservation education information therein.

(2) An ad hoc committee with representatives from various industries be asked to prepare a report of available private conservation resources—perhaps at no cost to the state.

(3) Revised concepts of a position of consultant are needed since they are too restrictive in present forms, not recognizing present trends in education. Since resources will not in the future lie in the hands of one person in the department of education.

(4) The Director of the Resources Agency be requested to prepare a report on their facilities, installations and operations available for in-service training.

(5) Comment be requested from the State Colleges and the University of California on pre-service and in-service teacher training.

(6) A plan be prepared for the cooperative development of in-service workshops using resources of educational, governmental and private institutions, including cost figures and alternative sources of funding.

(7) A plan be prepared for review by this committee for setting up pilot programs in conservation education for observation in various regions of the state, including some description of the cost with alternative funding.

(8) Other recommendations on instruction be reviewed with whatever action is deemed appropriate to support decision making by the board.

(9) The Legislative Analyst be asked to comment further on his ideas and suggestions as reported to the Senate Fact Finding Committee on Natural Resources.

(10) Recommend that available materials be reviewed in detail and accordingly reported on to the State Board of Education.

The State Board is most anxious that the committee evaluate critically and analytically all material prepared for it or presented to members, hoping that they will search widely beyond the usual sources for further information and creative approaches. In the exercise of the committee's responsibility to prepare comments and recommendations for the State board, it will probably produce reports of findings and recommendations which we may see fit to distribute widely.

In discussing sources of permanent support for carrying on a regular program, the impermanence of Federal funding must be noted and distinction made between carrying out ad hoc tasks of limited duration which are non-repetitious with Federal funds and regular tasks requiring continuing support with state funds. In any case, in line with procedures indicated by the A. D. Little reorganization study of the State Department of Education, we change the committee to secure complete plans with cost figures attached, clearly stated objectives and designs for evaluating the outcome.

The board is not enthusiastic about endorsing the funding of positions or programs when such are not clearly stated and where provision for evaluating performance and achievement is not made in the form of regular reports to the State Board of Education. If such provisions are made, it will then be possible for the board to report to the Legislature on what actions it has taken to improve conservation education and what will be needed for improved plans in the future.

You should know, as a committee, that the board has allocated in excess of $25,000 during the coming fiscal year, for the support of the committee and the various kinds of ad hoc activities it will engage in, designed to gather the information and make the plans called for in the various recommendations of the Senate Fact Finding Committee and the Asilomar Conference.

With your help, we hope to recognize through the medium of education that man must play a positive role in the development of our ecological system; and to impart to our children the realization that technological progress produces an impact on our civilization which calls increasingly for more enlightened judgment and a greater reverence for life.

CONSERVATION EDUCATION RESOLUTION

RECOMMENDED FOR ADOPTION BY THE CALIFORNIA STATE BOARD OF EDUCATION

Whereas, The conservation of our basic natural resources and the protection of our human and natural environment are critical issues in California as this state continues to grow at a remarkable rate; and

Whereas, Conservation means the wisest use and the most efficient management of all our resources and the protection of our environment for the benefit of the most people for the longest possible time; and

Whereas, The initiation and continuation of programs of wise use and efficient management of natural resources and the protection of our environment in the long run, depend upon an informed and educated citizenry; and

Whereas, The term "conservation Education" refers to an educational program designed to develop in pupils the proper knowledge, skills and attitudes necessary to enable them to make wise decisions as citizens with regard to the management and protection of our resources and environment; and

Whereas, The Legislature and the Governor, through the passage of Senate Bill 1, 1968 session, have required that adopted courses of study shall provide for instruction in conservation and protection of resources and in man's relations to his human and natural environment (*Education Code* Sections 8503, 8571–b and 8551–c); and

Whereas, The Legislature and Governor through the passage of Senate Bill 206, 1968 session have created a Conservation Education Service in the Department of Education to encourage the development of appropriate educational programs, and has authorized the State Superintendent of Public Instruction to make planning grants to local districts to develop local conservation education programs (*Education Code* Sections 363.5 and 6011.5); and

Whereas, A committee representing a broad spectrum of conservation interests was appointed by the State Board of Education to study the status of conservation education and to recommend improvements if needed; and

Whereas, This committee has now presented its report to the California State Board of Education,

Be is resolved:

1. The State Board of Education recognizes the great importance of an effective statewide program of conservation education in all schools and pledges its support and assistance when appropriate for activities at all levels designed to establish, strengthen and improve such programs,
2. That the State Board of Education urge the Department of Education to take all possible steps to implement, with adequate funds and personnel, the role of conservation education leadership morally and legally expected of it,
3. That the Conservation Education Advisory Committee be retained to advise the Board until a permanent statewide committee as specified in Chapter VII of the Committee report can be established.
4. That the Board of Education make the Conservation Education Advisory Committee report available throughout California.

Mr. SHAFER. A great variety of people worked on this report—Sierra Club people, businessmen, and government people.

Mr. BRADEMAS. Mr. Hansen.

Mr. HANSEN. Thank you, Mr. Chairman.

Before putting a question to you, Mr. Shafer, I would take advantage of this opportunity to express my appreciation for the privilege we have of coming to Los Angeles to conduct these hearings. I would also like to acknowledge the very great contribution that your own congressman here, Alphonzo Bell, has made not only in the development of this legislation but in the area of all of the problems that come before the Educational and Labor Committee. I would like to tell the people in this part of California that the rest of the country is deeply indebted to the people of the 28th District of California for sending us one of the most effective and respected Members of Congress. I say that very sincerely.

With respect to the bill, I think you have made some very helpful suggestions and I noted particularly your suggestion that we devise some means to encourage or perhaps even to require some kind of State participation as a condition of eligibility for grants. I assume that was, in effect, what you were saying.

Mr. **Shafer.** Yes. I was trying to be broad on that, that you might at least consider the importance of State participation.

Mr. **Hansen.** As you will see from the bill, it is contemplated that in this whole effort to educate the community, other noneducational institutions and, in fact, private, nonprofit institutions and organizations, will be eligible for grants.

Mr. **Shafer.** Is that so?

Mr. **Hansen.** I assume that your suggestion would be limited to the kinds of grants that might go to public educational institutions and that the grants that might go to non-profit private organizations need not be conditioned upon any participation by the State government.

Mr. **Shafer.** Yes, sir. I would hope that they might at least talk. In this field there is a tremendous amount of free and inexpensive publications. One of the things I would like to do is to bring the people together that publish all these different things and to talk over ways in which we might better utilize the tremendous amount of money and effort spent on this.

If the people could organize and work together on some of these things, they could cut out a lot of waste, I would not suggest the state would have the say-so over private groups but I would say that at least they ought to be talking, and at least be aware of what each other is doing. I am aware of the fact that whenever we do these things, we do a lot of overlapping and duplication. When we talk about conservation, we ought to be practicing conservation of human resources and materials. This is the reason for my suggestion. I am not of the feeling that we need control but we certainly need some kind of way to practice conservation as well as to learn about it.

Mr. **Hansen.** I appreciate that. I would welcome also any suggestions you may have from time to time on language that you think would most effectively accomplish the objective you have outlined.

Thank you very much.

Thank you, Mr. Chairman.

Mr. **Brademas.** Thank you very much, Mr. Shafer.

Mr. **Shafer.** Thank you.

Mr. **Brademas.** Your testimony has been most helpful and I must tell you that I do want, in spite of my criticisms in my questioning of you, to pay tribute to the leadership which the State of California has shown in this area. At least, you have got a law. Now, if you could get some money—Most States do not even have a law; so we are very grateful to you for having come.

Mr. **Shafer.** I do not make the financial policies for the State of California. They might be very different, if I did.

Mr. **Brademas.** We are not unfamiliar with that problem ourselves.

Mr. **Bell.** Thank you very much.

Mr. **Brademas.** We shall next have a panel of students and the Chair would like to ask them to come on up in the order in which he calls them, for the benefit of the members, so we can know who you are; and would counsel be kind enough to pull three or four more chairs up there.

First, Mr. Ron Eber, cochairman, Student's Environmental Confederation of California; San Fernando Valley State College.

Next, Mr. Nick Brestoff, director, Student's Environmental Confederation of California; editor, Daily Bruin; University of California at Los Angeles.

Next, Kim Marienthal, founder of Attack Contamination Today, University High School.

And Ora Citron of Ecology Action, University of Southern California.

Miss **Citron**. I am director of the Southern California Environmental Coalition of the statewide organization.

Mr. **Brademas**. The Chair would like to suggest, since we have all four of you meeting as a panel, that each of you make an opening statement. Would you like to summarize? Would you like to begin in the order in which I introduced you?

STATEMENTS OF RON EBER, NICK BRESTOFF, KIM MARIENTHAL, AND ORA CITRON, STUDENT PANEL

Mr. **Eber**. My statement is pretty short.

I would like to clarify. This Student Environmental Confederation of California, I put the membership list on your table. It, right now, is about 35 conservation-ecology action groups in the State of California, on the universities and the State college campuses and also several high schools and junior college groups. And I am also the president of the Mountaineering Conservation Club at San Fernando Valley State.

What I am going to present today is not a specific program in the field of environmental education but rather what I feel to be a chief concept upon which it should be based. In section V of the bill, an advisory committee on environmental quality education is established to "make recommendations regarding the allocation of funds under this act." My presentation is what I believe should be a key factor in the determination of which programs merit the funds to be allocated.

Therefore, the question before us today is not whether or not the bill is good or bad or should pass—could anyone argue against appropriating money for environmental education?—but rather, the question is now raised, "What is environmental education?" What are its goals and purposes and upon what concept is it to be based?

If environmental education is merely a new course or program added to the educational process or an education that teaches scientific solutions based on the possibility of new technology and the myth that growth equals progress, then I would oppose such education and, thus, this bill.

We cannot just add quantity or programs based on old assumptions to the field of environmental education without some idea of what its purpose is to be.

Since year after year, our ecological problems are compounded, what Aldo Leopold states in his book, A Sand County Almanac, about the present state of environmental education is most relevant:

> Is something lacking in the content, as well? It is difficult to give a fair summary of its content in brief form, but, as I understand it, the content is substantially this: obey the law, vote right, join some organizations and practice what conservation is profitable on your own land. The government will do the rest.

> Is not this formula too easy to accomplish anything worthwhile? It defines no right or wrong, assigns no obligation, calls for no sacrifice, implies no change in the current philosophy of values. In respect of land-use, it urges only enlightened self-interest. Just how far will such education take us?

My special concern is with Mr. Leopold's reference to a "change in the current philosophy of values." The following are my reasons.

Man is probably locked in a life or death struggle for survival. He is combatting a monumental environmental backlash of pollution and contamination which may well be overwhelming. However, man's attempts at combatting these problems based upon technological solutions and the old assumptions that caused the problems in the first place, although necessary for immediate health and safety, can only be a temporary delaying action. To secure long-term solution, man must deal with the cause of his problems. This cause is the lack of a broadly accepted environmental ethic dealing with how man perceives his role within the natural scheme of life.

How man perceives his role in the environment is then the root of our problems or the cause.

As man becomes aware of a perplexing question or problem in regards to his niche in the environment, either by revelation or education, he will seek an answer and, thus, make an evaluation. After an evaluation is reached, some course of action or response to the problem will ensue. It is these responses and actions that have caused our present environmental problems. If the revelation or education that I mentioned is changed, then man's actions also will hopefully change.

We cannot simply deal with the problems but must stimulate another evaluation based on sounder facts or a new ethic, free from technological myths, from theological prejudice and anthropocentric ideals. Biologist Garret Hardin, in "The Tragedy of the Commons," states that the "problem has no technical solution. It requires a fundamental extension in morality." Changes in morality connect the problems and causes with theology and philosophy.

Also, Leopold eloquently explains ecological philosophy by bringing together ethics and ecology. "This extension of ethics, so far studied only by philosophers, is actually a process in ecological evolution. Its sequences may be described in ecological as well as in philosophical terms."

What are these ecological terms and what is ecology? Ecology as the core of environmental education, is more than a system of nature. It is also one of human relationships. The ecology movement and environmental education must seek to do more than clean up rivers and the air or stop the use of pesticides. They must seek to stop all practices that degrade or destroy life and environments on the planet.

But what are the terms of ecologically relevant education? Paul Shepard, in his introduction to the book, "The Subversive Science, Essays Toward the Ecology of Man," states:

> Ecology deals with organisms in an environment and with the processes that link organism and place. But ecology as such cannot be studied. Only organisms, earth, air and sea can be studied. It is not a discipline. There is no body of thought and technique which frame an ecology of man. It must be, therefore, a scope or a way of seeing. Such a perspective on the human situation is very old and has been part of philosophy and art for thousands of years. It badly needs attention and revival.

In our colleges, we must get away from specialized education when dealing with environmental problems. Biology shows us that all life is interdependent. Therefore, the perspective or outlook that Shepard speaks of can best be achieved by interdisciplinary studies. This would be a synthesis of the biological and environmental sciences with the social and cultural sciences.

So what I am advocating is an environmental education that is more than solution oriented, more than an education that will solve our short-term problems, more than an education of requirements to meet professional qualifications, but rather an education that has us ask, So why do we do it? What good is it? Does it teach you anything, like determination, invention, or improvisation, foresight, hindsight, love, art, music, religion, strength or patience or accuracy or quickness or tolerance or how long is a day and how far is a mile, and how to rely on yourself?" So what is the philosophy that Shepard feels needs revival? What is the perspective that environmental education must have as its goal, its purposes and as its core concept?

Stephanie Mills puts it this way:

> To aspire to survival and to aspire to humanity are the paths. They are one and the same. All the logic, precision and practicality in the world can't save us if we lose our own soul. There can be no survival without passion. Passion for humanity, love of the earth, joy of existence and hope for the future. . .

It is these concepts that environmental education must embrace. This kind of education will enable man, us, to perceive a sense of time and place within the context of all life.

To teach, in the classical sense of the term, this kind of education is impossible. It will take not just a qualified, degreed teacher, but a leader, one who understands the sense of the awe and wonder of life, not to teach it but to inspire, to help us experience the joy of existence and, thus, a will to survive.

The preamble of the United Nations Educational, Scientific and Cultural Organization (UNESCO) Charter begins, "That since wars being in the minds of men, it is in the minds of men that the defenses of peace must be constructed," and I would add that it is within the minds of men that the principles for his survival must be created. However, it will take more than facts or concepts within our minds. It will require that deep feeling within us, that "Passion for humanity, love of the earth and hope for the future."

Paul Shepard, once again, explains that ecological sense:

> Truly, ecological thinking need not be incompatible without place and time. It does have an element of humility which is foreign to our thought, which moves us to silent wonder and glad affirmation. But it offers an essential factor, like a necessary vitamin, to all our engineering and social planning, to our poetry and our understanding. There is only one ecology, not a human ecology on one hand and another for the subhuman, no one school or theory or project or agency controls it. For us, it means seeing the world mosaic from the human vantage without being man-fanatic. We must use it to confront the great philosophical problems of man—transcience, meaning and limitation—without fear. Affirmation of its own organic essence will be the ultimate test of the human mind.

Mr. Brademas. Thank you.

Mr. Eber. Thank you.

Mr. Brademas. In my judgment, that is a first-class statement.

We will not put questions to you right now but invite your colleagues to speak.

Mr. Brestoff.

Mr. **Brestoff.** It seems, with that introduction, appropriate that the order is as it is. I will be talking mostly about college level and university action, education, and I think Ora then will be talking about secondary education and Kim, on some things that have happened in high school.

Mr. **Brademas.** Could you hold up a minute.

Can everyone in the back hear?

From the Floor. No.

Mr. **Brademas.** Do not be shy of that mike. Speak right into it.

Mr. **Brestoff.** I would like to offer also for the record, if you have not seen this, it is a report to the President's Council.

Mr. **Brademas.** Yes, we have seen that. It is in the record. Thank you.

For the benefit of the record, the report to which reference is being made is the report of Dr. Steinhart.

Mr. **Brestoff.** Stacey-Turner Act.

Mr. **Brademas.** Stacey-Turner Act, to the President's Environmental Quality Council.

Mr. **Brestoff.** Well, let me begin.

Environmental problems are global in scope: instances of reduced fish catches have been detailed in this country, the Soviet Union, Europe, and Latin America; air pollution and solid waste problems affect the major urban centers of Tokyo, Los Angeles, New York, London, Calcutta, and so forth; the world's population, according to United Nations estimates, is likely to reach 7 billion in the next 30 years; such resources as silver, mercury, tin, and cobalt are already in short supply; the food resources of the world are both inadequate and inadequately distributed to the tune of malnutrition in over two-thirds of the world's populace; adventurers find the waste products of civilization in ocean waters outside the sight of land.

Mr. **Brademas.** I am sorry. We have a hard time up here hearing you so those in the back must have a horrible time.

Mr. **Brestoff.** Contrast the above brief list with a statement by a senior at the University of California:

> It gets pretty depressing to watch what is going on in the world and realize that your education is not equipping you to do anything about it.

Add the fact that knowledge is doubling every 7 to 10 years and we have some idea of a world racing forward with much too little planning and a great many serious problems, including the specters of wars all over the world and racism, to boot.

The student of today has grown up in a very different world from that surrounding the student 20 years ago. We cannot escape the fact that we face both instantaneous destruction through ever-expanding military systems and also slow, agonizing death from environmental pollution, overpopulation, and resource mismanagement.

Because of these forces, presented daily on television and front page newspaper stories, "in confronting the future, students of today are less concerned with rejecting the past than with the meaningful relationship of the present to that past and to the future." (John McHale, The Future of the Future, 1969.)

No male student thinks about graduate school or a job after graduation without thinking of the prospects of instantaneous destruction via the draft or slow death via repeated health insults by the environment in which his school or home is located.

And let me provide myself as an example of the latter's influence. Though I intended, at one time, to attend graduate school at UCLA, I will not do so because I believe the city to be a respiratory health hazard due to air pollution. I am supported in this judgment by 60 medical faculty at UCLA who suggested by petition 2 years ago that those people without pressing need to stay in Los Angeles should move elsewhere. If you were athletes, gentlemen, I should think you would not have come here.

I have suggested that more, much more, happens to our planet and our lives in some given period of time now than at the turn of the century. This phenomenon, I believe, is known as time compression. How are we dealing with this rapid change? Not at all well, at least for the student at the university level.

And yet, if colleges and universities embarked upon action educational programs for social change, they would be acting in terms of national biological security.

These programs would provide excellent education through experience in the planning function and at the same time, promote better understanding between community leaders, investors and developers, and local government. The structure could be schools of the human environment, as suggested for Federal support by the Office of Science and Technology's "Report on the Universities and Environmental Quality"; or an umbrella, interdisciplinary institute combining relevant parts of already existing institutes. Off-campus research centers would provide real urban environmental problems for students, faculty, and the community to solve.

Let me say here, that in order to find solutions, much more research and development is needed. Problems exist, we all recognize that; but understanding does not exist, and only from research will we understand sufficiently, the chemistry and ecology of the air, land, and ocean systems, to suggest solutions through education.

"With all thy getting," it is said, "get understanding." If the Environmental Quality Education Act does not provide for research efforts to support educational endeavor, in-depth understanding will not be available, and the bill will be hollow.

To illustrate, in Los Angeles, there is but one measurement of the vertical air profile. That is at Los Angeles International Airport, by radiosonde weather balloon. In the State of California, there are only two such measurements. We do not know what is happening starting from ground level and going up. Also, according to UCLA chemistry and geophysics professor Willard F. Libby, a Nobel prize winner, we do not know where the productive areas of our ocean resources are. We do not know, according to testimony before the Senate subcommittee air and water pollution, how to build municipal incinerators and sewage systems. According to Dr. Libby, again, in a conversation just a couple days ago, Detroit believes it can purchase a catalyst for oxides of nitrogen emissions from its automobiles. None exists, in fact, because insufficient research has been carried out.

This goal of problem solving, especially with regard to environmental problems, is a new role for most universities, however. Indeed, it has been missed. Robert Heilbroner, in the January 3d issue of

Saturday Review, specifically delineates applied research for social change as his educational priority for the seventies:

> We live in a time, during which social experimentation—in the factory, in the office, in the city, in economic policy, in political institutions, in life styles—is essential if a technologically dominated future is not simply to mold us willy-nilly to its requirements.

But students seem to lack a comprehensive view of the world, through education, because at present it does not agglomerate the pieces (social science, life science, physical science and the humanities) in a cohesive, relevant whole. It has been said, for instance, that America is the only country where youngsters are required to "fritter away their precious years in meaningless peregrination from subject to subject * * *" There is no unifying theme. I suggest, Survival. (Garrett de Bell, ed., *The Environmental Handbook*, 1970.)

To do this, interdisciplinary work would be necessary, and it would seem that university breadth requirements are a valid precedent. To do this, research and action toward social change would also be necessary. The example here would be work on programs connected with the Department of Defense, the Office of Naval Research, and the Atomic Energy Commission, who control approximately 88 percent of all Federal research and development funds. (McCain and Segal, "The Game of Science, 1969".

True, examples of environmental interdisciplinary work can be found: The Argonne Universities Association, the University of Georgia, Antioch with an Environmental Studies Center, and Stanford, for instance. But if the Environmental Quality Education Act does not provide for two recommendations made in the Universities and Environmental Quality report, they will be exceptions. The two recommendations are: (1) Substantial or complete control of the faculty reward structure, and, (2) freedom to be innovative in introducing course material, educational programs, work-study programs, and curriculum requirements for degrees.

At UCLA, the two problems exist openly, except for one instance, the Institute of Geophysics' doctor of environment graduate program.

Let me recall for you my experience. I thought that through proper channels and by sufficient homework that the university might establish an interdiscipliary framework for environmental study.

I had been contacted by representatives of the newly formed R. J. Beaumont Foundation for Environmental Preservation. They mentioned to me their willingness to support as well as raise funds for a new structure on campus to house an interdisciplinary environmental program. I then contacted Dr. Stanley Greenfield, head of the department of environmental sciences at the Rand Corp., in Santa Monica. He indicated that his department would be interested in associating with such a university program. I also related the idea to Mrs. Ellen Stern Harris, the citizen member of the Water Quality Control Board, Los Angeles region, and executive secretary to the Council for Planning and Conservation, a collection of over 60 community affiliates. She, too, was enthusiastic about the notion.

In a letter to selected faculty members, the deans of related schools and directors of appropriate institutes on campus, I outlined the suggestion and asked for letters of support, in return. With these in hand, I presented the suggestion to the vice chancellor, David Saxon. A representative of the Beaumont Foundation was present. He was told, properly, that the university would have to solve internal matters before negotiations could begin.

The vice chancellor then called a meeting of some 20 campus leaders. In the meeting summary, it is stated that—

> Problems involved in organizing and coordinating interdisciplinary programs between departments or major discipline areas are so great that a coordinated effort would be almost impossible. Enterpreneurship by groups with common interests was suggested as the most practicable means of organization.

In my opinion, the last sentence is meant to describe the following: departmental and program jealousies preclude anything but a dog-eat-dog reality wherein empire building is the prime energy sink. Needless to say, I was astonished to hear one leader turn to another and say, "How are you? It's been 4 years, hasn't it?"

It was suggested then and then again at a second meeting, that paper bag lunch discussions would provide a means for better communication between social scientists and physical and life scientists. It appears that these luncheons are as far as the university is willing to venture.

Even faculty members have difficult times when they propose such programs. One professor, Dr. Howard Mitchell, a former World Health Organization consultant to India on population program, was asked to come to UCLA to design a population and family planning institute. He did so, but because his program has not been acted upon for some time, he is leaving Los Angeles to meet this most crucial problem elsewhere. Other faculty members, because of their intense desire to use their knowledge in teaching and community effort, have missed scheduled promotions because they lacked the proper number of written papers. The Environmental Quality Education Act should include provisions to facilitate the efforts of such professors, through substantial funding.

Now, let me remark about a few things I have learned. The first is that interdisciplinary efforts can be successful. I coordinated a student ecology study area where, for instance, an art student, female, and a history student, male, authored an 80-page survey of estuaries in California. They did so by traveling, conducting interviews and reviewing current literature. According to the Office of Science and Technology's report, there is a national interest among students for work in environmental areas.

The second piece of information I can offer is that it seems that a program for interdisciplinary work really needs a home, a physical place that can be visibly identified as an information and conference center. Presently, formal department structures prevent students interested in the new found science of ecology from getting the best education available. At present, the only solution is for those students to elect associated courses in all the relevant departments.

A third thing is that "action research" is highly valuable in the strictly educational sense. Most of my education has been outside the classroom.

Lastly, I would remind you that education faces an exponential challenge with respect to the numbers of students seeking services in the near future. According to Rene Maheu, Director General, United Nations Educational Division, Scientific and Cultural Affairs Organization:

> * * * changes may be expected in organization with comprehensive schools more general than they are now and a better blend of academic, cultural and practical elements in the curriculum. (Nigel Calder, ed., "The World in 1984", 1964.)

Comprehensive, practical, the words seem to underscore the phrase "environmental action research and study."

I am dwelling on action, research, and study, though not necessarily in that order. Why? Because "education is one of the core institutions charged with the transmission of values, meaning and the understanding of change in human society. Its largest deficiencies have been in this area." (McHale, "The Future of the Future".)

Mr. Brademas. Mr. Brestoff, I wonder if you would not mind if we interrupted you at that point and let the rest of your statement appear. I am very fearful that unless the witnesses summarize—there are seven other witnesses to be heard from—we are not going to have a chance to put any questions to you.

Is that all right? I think——

Mr. Brestoff. I have a page and a half and I would like to finish it, because it goes into more depth.

Mr. Brademas. All right, go ahead, but I am going to have to call on your colleagues to summarize because they will not have time, I fear, to read their entire statements, so we are not going to have a chance to hear from other people.

Mr. Brestoff. I shall close with a description of the doctor of environment program I mentioned previously. I do so because I believe it to be a good model for others and worthy of heavy funding. The program, involving 3 years of study and 2 years of internship with industry, Government or a conservation organization, would bestow a professional degree, analogous to the M.D., to the successful student. The student, hopefully entering with a bachelor of science, would study a core program of environmental earth science, chemistry, engineering, medicine, biology and public policy. He would choose an area of specialization with an adviser and also a breadth program to cover related, touching fields. When the student enters the field training period, adjunct professors selected from qualified supervisory staff at the internship institution become the student's guides on the job. The degree is awarded on completion of the internship program, including a final oral examination by the committee of university advisers, and a written or seminar report by the student on his field experience.

A final word on funding. The director of the above program, Dr. Libby, has remarked, as I mentioned, that there is a good deal that remains total mystery. He estimates that $2 billion is a proper national figure for the research and development work that needs to be done to support any educational program of national scope. It has even been suggested that the various Federal departments concerned with environment be combined into a commission with the funding power of the Atomic Energy Commission.

I hope that happens, and that this bill facilitates such unity to the fullest.

And that this bill and bills like it, be followed quickly with financial companions amounting to no less than $2 billion.

Mr. **Brademas.** Thank you very much.

Mr. Marienthal.

Mr. **Marienthal.** Could I wait until we get some copies of the statement?

Mr. **Brademas.** Miss Citron, could we hear from you? I wonder if you could try to summarize your statement. Otherwise, we will never have an opportunity to hear other witnesses. Then, we would like to put questions to all of you.

STATEMENT OF ORA CITRON, DIRECTOR, SOUTHERN CALIFORNIA ENVIRONMENTAL COALITION

Miss **Citron.** I will try my best, Mr. Brademas.

Mr. **Brademas.** All right. We will put your entire statement into the record.

(Miss Citron's statement follows:)

Statement of Ora Citron, Ecology Action, University of Southern California

The imperative and urgency now recognized by an increasing segment of our citizenry, for implementation of sound, progressive and mature ecological-environmental education can be evidenced by the presence of the Environmental Quality Education Act, in both houses of Congress. It is yet to be seen what the national commitment will be for this act.

It must be clear to many that the American system of democracy has been, as has most western political philosophy, a plague on the species *Homo sapiens*. The tenant of western culture is based in the authority and validity of individual desires designed to appease the individual. This has been decisively true for the American citizen. If I want a car, another child, a new refrigerator, a new housing site—these are all within my rights of ownership and self aggrandizement, should I have the money to purchase them. This is a politico-cultural ethic—a product of man's brain and not of his biological heritage. The biological heritage, of which I speak, has been part of a biological evolutionary process two hundred million years long.

Our psycho- social or cultural evolution has been superimposed upon this process in just the last two tenths of a million years. It presently appears that the two may not be complimentary or compatible. The well-being of *Homo sapiens*, that is the collective, biological species, simply has not been the concern of cultural society. The emphasis of environmental education must focus upon this issue—a comprehensive understanding of man's biological evolution and his ecological stance within nature, as a part of the natural world. A course in basic ecology and evolution should be made mandatory in grades K–12, throughout the United States, underscored as heavily as is the teaching of mathematics, English and American government courses.

The need for this education is currently here. It is not a concept we anticipate for an uncertain, problematic future; nor is it an unsubstantiated supposition. We are currently losing a battle we can ill afford to lose. This battle threatens the existence of *Homo sapiens*, as well as the Bermuda petrel, the California condor and the California brown pelican. The latter are signposts from which we dare not turn our eyes. I choose to believe that all hope is not forlorn, respite the evidence to the contrary. Immediate action is requisite in a magnitude hitherto only achieved by Madison Avenue public relations and advertising. We are faced with an epidemic of acute ignorance. The remedy must come in strong doses, long supply and administered by our most able physicians. The Federal government must exercise strong support, a commitment measured by flexible programs and generous funding. Such programs should be available not only to major educational institutions, but to private, grass-roots organizations diligently working to further the goals outlined by this act.

Homo sapiens has been forced into high noon by the cultural society. His success is dependent upon cumbrous changes in cultural attitudes and mores. This is the challenge and the survival test. It is our obligation to develop an environmental morality in the public, a sense of personal and collective responsibility for the state of the nation. This vast undertaking can and must be achieved with great dispatch. We do not have fifty years to devise a plan of action. The achievement of our goals must begin to show itself quickly, and can only be adequately realized through mass education.

The importance of environmental education does not rest solely with the adult community. We must reach the youth of the nation in order to build for an ecologically sound future. We must foster primary and secondary education programs which will result in an awareness of, and appreciation for, the environment and man's interdependence with it. In the final analysis it is a commitment to change in life styles. This requires inclusion of ecological-environmental instruction appropriate to all grade levels and subject areas throughout the entire school system and its curriculum. Such a model program was devised in California as the result of 1968 legislation. Unfortunately the state has not yet realized its commitment and has failed to provide funding for this legislation. Repeat of a similar performance by the federal government would indeed be a sad commentary on our learning processes.

The state of California has begun the task of educating its inhabitants by the development of the aforementioned program, though its has yet to provide the necessary funds for implementing it. Many states have not yet assumed their responsibilities in this field. It should be incumbant upon the Federal government to establish some coordination and implementation of national programs directed by every state. It is insufficient to have any less than 100 percent of our citizenry educated to the problems inherent in being a part of our ecosystem. A national approach and emphasis is urgently needed. Each state should be strongly encouraged to provide a Conservation Education Service in the State Department of Education. Functions of this service would be.

(*a*) to compile and disseminate bibliographies of available resource materials,

(*b*) to act as a consultant service to the school districts in conservation and outdoor education as requested,

(*c*) to prepare an annual Conservation Week mailing to all schools (as done in California, for example), and

(*d*) to perform other related services and responsibilities as deemed appropriate.

The Federal government can assist state education programs by providing support monies for in-residence sites and outdoor education camps.

Large sums of money will need to be requisitioned. One primary purpose for such money should be an environmental data center using computer information networks, storing information on resource people, organizations, projects, local problems and ecological data. Such systems have been in use for twenty years, i.e. the Air Defense Command SAGE system. We should do not less for our living environment than we have for the pentagon's efforts.

Critical to any education process is the knowledge and capabilities of the instructor. Well intentioned, well designed, creative programs are functionless without the educator. Give a child a creative, inspired and knowledgeable instructor and the learning process will be implemented in spite of material deficiencies. But the teacher is essential. Thus I would enjoin you to look quite seriously at programs for pre-service and in-service training of teachers at all levels. I have personally witnessed an instance where a progressive instructional program was implemented for second and third grade pupils, and the teachers were incapable of enhancing the learning abilities of their students due to the instructors lacks. To remedy the situation students from the University of Southern California were engaged to aid the teachers. There are two salient points to be gleened:

1. Teacher education programs are critical to the education process, and
2. Non-credentialed, well-informed individuals can be employed in a time when there exists a lag between the idea and the proper implementation of the program.

I would like to urge you to include in your program directions to the schools of education to make conservation education training and education in population problems mandatory for teaching credentials.

Furthermore, encouragement should be proferred to students and other involved individuals to participate in environmental education. I have personally witnessed instances where high school students were far better versed on environmental topics than either their teachers or the governmental personnel to whom they were addressing their thoughts.

Students are capable of offering assistance to the educational system. These efforts can be directed toward state, local and outdoor education programs. Their advice in program design should be sought in an age where relevance is often lacking between youth and established systems. Assistance is forseeable to administrators, school boards and individual teachers in providing resource materials and manpower to aid these programs and especially in the area of outdoor community and on-sight outdoor projects.

It is self-evident that pertinent teaching aids are indispensable to classroom education. Two essentials are necessary to meet these needs, research on specific teaching methods and development of worthwhile teaching materials.

At the university level funding should be provided for environmental study centers, for teacher training aid, fellowships, research grants on specific problems and more Junior White House Fellow positions, not just in the White House, but at state and local levels.

There are two points in the present bill to which I would like to address attention. Lines 24 and 25 on page 4, through line 5 on page 5 seem to provide the states a power which one would choose to deny them, if the federal government is earnest in its commitment to effecting major solutions to our environmental problems. The political concept of states rights must not become an issue in this discussion. Under this description should the state choose to deny funding to a worthy project, the Federal government would have stipulated its disinterest in aiding such a program. The Federal government must be ready to aid pertinent environmental pursuits regardless of state commitment. Under present wording the state is empowered to stymie any project by removing financial support. We are all too familiar with the products of interest conflicts and self-interest motives. In our own collective best interest we must offer as many viable alternatives to environmental problem solving as is creatively possible.

Secondly, it behooves Congress to define clearly and without reservation its interest in obtaining and encouraging effective educational programs. It should be prepared to reward programs demonstrating ability in achieving change with continued support. Evaluations, as designated in lines 6–13 on page 3 must be made with further attention toward the goal. All too often program evaluations are made and laid to rest in some forgotten file. Evaluations must be made with goals of defining improvements and continuations of laudable projects. We must recognize that most of us are fledglings and ingenues in this area of prime importance.

My suggestion is that in both of the above mentioned areas the wording of the bill is weak. Clearly the bill is a strong step in the right direction, but it does not go far enough. National attitudes reflect the attitudes of the national leaders. They must be bold enough to confront the issue with force and clarity. The quest for environmental responsibility in attitude and action is beyond the scope of political faction and self-aggrandizement. Should we choose to negate these ideas we will have chosen to negate our continuance on this planet.

This is a unique moment in time, in both its occurrence and in that it is not being ignored. For centuries we have denuded our life support system. Today we occupy the threshold of our mutual and often neglected responsibility for Mother Earth. If there is anything which we can still proclaim of the Christian ethic it is not to give up a worthy fight until it is won in our favor. To our legislators is entrusted the responsibility to act wisely in our behalf. It is evident that no one has all the facts or even, perhaps, half of them. Thus it is mandatory that we act in such a way as to offer as many rational choices as is possible by supporting programs at all levels of personal involvement.

Miss CITRON. From what Mr. Shafer said, I would like to address myself to two points from my statement and that is the opening points about what I feel is a more ethical imperative that we must now instill as a national effort, a national, cultural, attitudinal change which is, I feel, imperative; and to the two points in the bill, which, at the end, I discussed.

I think it is clear that there is an imperative and there is an urgency for environmental education.

I think the greatest evidence of this is that there are presently 80 laws in the California State Legislature specifically on air pollution and there are not 20 worth passing.

I feel that the primary reason for this is that our legislators do not have the facts—the facts may not be available—and in other cases, they may be, but they have been pressured by public sentiment to get their name on a bill to insure that they be re-elected in November.

This is a problem not just at a State level, obviously.

Mr. Brademas. You are quite right about that.

Miss Citron. OK. Well now, I cannot understand, for instance, the Clean Air Act by reading it. Okay. And I expect that they do not understand me when I am talking in a biological jargon.

One of our essentials is to have a translation system to legislators to whom we entrust, hopefully, wise decisions on our behalf.

It is certainly well understood that this education is needed. I think also that it is evidenced by the fact that there is this Environmental Quality Education Act in both Houses of Congress and that we must pay very strict attention to it so it can be implemented in the most feasible, rational way possible, if that is possible, at all.

I think that it is clear to all of us, or at least to many of us, that the American system of democracy has been one that has been, I think, a plague on the species homo sapiens and I think what we need to do is to really understand the difference between homo sapiens as a species, and society as a collective group of individuals who are oriented on a temporal-mind basis. We have done very little to aid homo sapiens.

We have done, often, a lot of injurious things to society as a cultural entity and I think we have to start educating people to the understanding of the fact that we are animals and a part of the natural world.

If we continue to believe that we are somehow exempt from natural laws, if we believe that we are exempt from the plague, and present danger of pesticides, for instance, on the California condor and on the brown pelican, then we are really in a bad way. We have to recognize our part in the natural world.

I think this is the kind of cultural attitudinal change that has got to take place.

We keep thinking we can do anything, we have the right to say anything. Well, I do not know about speaking but we have the inherent right, as individuals of a democracy, supposedly, to choose to do anything we want. We are supposed to do this in mind of collective society and not stepping on each other's toes but we certainly do not seem to do this in terms of the collective species. We do not seem to think there is any need for regard of that.

I have heard lots of comments especially after Earth Day, April 22, of which I think you are probably all well aware, concerning population, for instance. People were saying, "I can have as many kids as I want, if I can afford them." And this is certainly not true, I do not think.

Mr. Reid. What would you recommend on that?

Miss Citron. On population?

Mr. **Reid**. Yes.

Miss **Citron**. Well, I would recommend that we must—I'm trying to put this in a way that is very clear, and it is difficult because I am extracting, thoughts. It is important that, first of all, we have some kind of population studies to determine what population growth is like for homo sapiens.

We understand, biologically, there are two forms of growth, one which grows up to a peak and uses all of its environmental available resources. In using them all up, there is nothing for them to subsist on again, so it drops off. This is called a J-shaped curve.

There is another kind which gets up and levels off on an equilibrium. We do not know about man. There is a possibility we could get up to the J-shaped curve and be dead, having no more resources.

I support the tents of zero population growth. In actuality two and seventenths children per family, for the number of people that can reproduce, and do so, will actually level population growth. Not only must we instill committment to this idea, but provide incentives, i.e. by tax means, to promote it.

Mr. **Reid**. Thank you.

Miss **Citron**. I think, to sum up the first part of what I am saying, simply that we have got to look very carefully at which I call a politico-cultural ethic and turn to a kind of responsibility that is individual and collective for homo sapiens, in terms of a stewardship not only of the earth, but of our part within it.

And then, regarding the bill itself, I think it is a step in the right direction. I think it has a lot of potential. I think we have to provide it with as much potential as feasibly possible. This is one of the areas where we need to spend a lot of money.

We do not have all the answers. We have some of them. And we have just got to do as many things as possible to see what is going to work. People just have not been working very long at it.

Ecology itself is a very young science. People throw the word, "ecology," around very loosely. We have to look at what is the difference between ecology and environmental problems.

There are two points in the present bill to which I would like to address attention. Lines 24 and 25 on page 4, through line 5 on page 5, seem to provide the States a power which one would choose to deny them, if the Federal Government is earnest in its commitment to effecting major solutions to our environmental problems. The political concept of States' rights must not become an issue in this discussion. Under this description, should the State choose to deny funding to a worthy project, the Federal Government would have stipulated its disinterest in aiding such a program. The Federal Government must be ready to aid pertinent environmental pursuits regardless of State commitment. Under present wording, the State is empowered to stymie any project by removing financial support. We are all too familiar with the products of interests conflicts and self-interest motives. In our own collective best interest, we must offer as many viable alternatives to environmental problem solving as is creatively possible.

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We must recognize that most of us are fledglings and ingenues in this area of prime importance. My suggestion is that in both of the above-mentioned areas, the wording of the bill is weak. Clearly, the bill is a strong step in the right direction, but it does not go far enough.

National attitudes reflect the attitudes of the national leaders. They must be bold enough to confront the issue with force and clarity. The quest for environmental responsibility in attitude and action is beyond the scope of political faction and self-aggrandizement.

Should we choose to negate these ideas, we will have chosen to negate our continuance on this planet. This is a unique moment in time, in both its occurrence and in that it is not being ignored. For centuries, we have denuded our life support system. Today, we occupy the threshhold of our mutual and often neglected responsibility for mother earth. If there is anything which we can still proclaim of the Christian ethic, it is not to give up a worthy fight until it is won in our favor. To our legislators is entrusted the responsibility to act wisely in our behalf.

It is evident that no one has all the facts or even, perhaps, half of them.

Thus it is mandatory that we act in such a way as to offer as many rational choices as is possible by supporting programs at all levels of personal involvement.

Mr. Brademas. Thank you very much, Miss Citron, for a very thoughtful statement.

Mr. Marienthal.

Mr. Marienthal. May I have 4 minutes. I am sorry I do not have copies but——

I salute, greet, praise, applaud, cheer, hail, the implication of the Environmental Quality Education Act, but I approve of it as only a beginning, an introduction, as to what our Government must really do. That beginning step is always the most difficult. For this reason, I will give the bill all the acclaim it deserves.

I hope to hasten the acceptance of this bill by telling the subcommittee, from the inside, about the absence of education in matters concerning the quality of our environment. As a high school student, I see not only what is missing; I feel it when I find that my friends have little or no understanding of the magnitude of ecological problems. I have read many books, magazines and pamphlets on environmental issues. I have also been to several ecological fairs and have had personal talks with a variety of experts dealing with ecology. I am appalled at the lack of knowledge my peers display on topics of air, land, water and noise pollution. Even more frightening is that they still think such concepts as abortion to be dirty. They know little about imminent food shortages facing the world, including the United States. They don't realize that overpopulation is the root of such problems. These very issues will decide the future existence of mankind.

Before I attempt to pass judgment on the ignorance of many fellow students, I must quickly reexamine the school system where it breeds.

Dr. Robert Maynard Hutchins, of the Center for the Study of Democratic Institutions in Santa Barbara, sums it up—

> With an educational system that does not educate and a system of mass communication that does not communicate, we have become incapable of the discussion by which political issues are determined.

A political document leading to an increased ineffectiveness of the Los Angeles school system is California Senate bill 413 introduced by Schmitz and Walsh (Sex Education Act to add section 8506 to Education Code).

Such bills like this, distributed throughout the Nation, advocate that sex education can be taught only in classes where students have parent approval forms.

Abortion and overpopulation are subjects not allowed to be discussed openly.

Protecting students from unnecessary "no-no's" is one thing, but to deprive them of vital information during these perilous times is a step toward genocide.

Laws such as this do not serve the public well and are not in the American spirit of free inquiry.

Even if the Schmitz bill were to be repealed, this would not guarantee that factual materials or worthwhile classes would become available to deal with these most urgent issues facing my generation.

A law requiring that conservation classes be taught in the schools was researched by Rudolph Shafer, but no funds were provided to put the law into effect.

It was like dangling food in front of a starving person with hands tied behind his back.

Many students are moved toward rebellion and riots by such gaps in education.

Those not so attuned will sit back until destruction is upon them.

As H. G. Wells put it: "Human history more and more becomes a race between education and catastrophe."

My fellow students are distressed that $80 billion are being spent on military defense and only $16 million on population control, the defense of our enviromnent.

They have lost faith, and distrust most of the current policy which controls their destiny.

The tide could be reversed by the passage of the proposed Environmental Quality Education Act.

As technology keeps pace with the population, the need to change existing laws and to understand the laws of nature has become acute.

Previous generations were not faced with this urgency.

It is up to the students of today to relate them in detail to their elders.

Thus, the very survival of the human race is directly dependent on the effectiveness of our educational systems.

I had generally assumed that funds needed for environmental education would surely become available.

Until they are, the most forceful step led to the formation of a network of student groups designed to relate ecological problems to the community.

So, together with dedicated helpers, I formed ACT, Attack Contamination Today.

While such ecology groups have been started elsewhere, ACT advances their concept by unifying separate secondary school elements and enthusiastic forces into a powerful whole.

They can then take on grassroots work so desperately needed.

Grassroots means reaching into the community and starting projects such as recycling, passing on information about the need for population control, matters relating to rapid transit and many vital aspects of our endangered environment.

Let me summarize what ACT is doing and what more it hopes to accomplish in the future.

I would like to relate how a group of more than 150 students was organized at my high school.

The following committees and their responsibilities were created:

A. PROGRAM COMMITTEE

1. Objectives: To produce presentations in an effort to educate and inform students and community of ecological problems.
2. The committee member's responsibility: To bring forth or create speeches, tapes, films or other materials for presentation. Also to find speakers for assemblies or individual classes.

B. PUBLIC RELATIONS COMMITTEE

This committee has the most interest and support.

1. Objectives: To activate people of the community to do their part in the fight against contamination.
2. The committee member's responsibility: To create and find literature and petitions to be circulated throughout the community.

C. SCHOOL AWARENESS COMMITTEE

1. Objectives: To turn the student body on to the subject of ecology and make them an aware and active group in the fight against pollution.
2. The committee member's responsibility: To design posters and write fliers and speeches to be presented to homerooms, assemblies and other student body gatherings.

D. LETTER WRITING COMMITTEE

1. Objectives. To promote action by Government and industry to halt unnecessary pollution-producing activities.
2. The committee member's responsibility: To write letters to influential Government bodies, groups and people concerning specific environmental problems. The committee's duties are expanded upon by the need for original letters, researchers for important people to write to and newly arising problems.

The results of this organization plan are as follows:

Groups of students have set up tables with literature and petitions to inform the public about overpopulation and pollution.

A recycling project has begun where students are asking neighbors to save recyclable materials.

The students pick up the materials once a week, and we are presently trying to establish recycling centers on all school campuses.

We hope to pressure the sanitation department into separating limited resources from trash.

Many more students are riding bikes to school and many students have taken it upon themselves to keep the campus clean.

While accomplishments are still in the forming stage, the basic structure is there with which to do a great deal more.

Enthusiasm is building and even if the growth is slow, I know our generation will ultimately do its share to support the dedicated work of congressional committees such as this one.

We, of the younger generation, share with all the world the deep concern for our future.

Mr. Brademas. Thank you very much, Mr. Marienthal.

Thank all of you for your very interesting statements.

We will begin the questioning with Mr. Reid.

Mr. Reid. I would like to thank Mr. Eder, Mr. Brestoff, Mr. Marienthal, and Miss Citron for what has been a very helpful, articulate and comprehensive presentation.

I would like to ask Mr. Eder if you would comment a bit on how you would define a new ethic.

You also touch on the problem that growth does not necessarily equate with progress.

What is your view about Campaign GM? What kinds of questions do you feel should be the ones considered in combining ecology and ethics for getting the kind of sense of values we need?

Mr. Eder. I would say that the key thing I was hitting at in there was that the ecology movement must get involved with stopping anything that degrades or destroys life and I think any movement that is presently on our campuses today, if it has any one thing that is unifying, it is for life.

Mr. Reid. Well, as a starter, would you agree that, in effect, the policy of the Federal Government should be that nothing should be permitted to be built, whether it is a powerplant or a nuclear station or internal combustion engine, if you will, if it seriously pollutes the environment; and, second, that we should not give license just to build or put out a pesticide unless we know, very carefully, the genetic and other considerations?

We leaped into technological change without having any real testing on homo sapiens.

Mr. Eder. Yes. We cannot let the technology be the guiding force in our society. It has to be guided by what is best for homo sapiens. In other words, you cannot allow someone to have a plant or build something if it is going to destroy life or be harmful to us and it should be well studied, before.

In other words, on the thing on pesticides, we should not have to prove that it is harmful to us. They should have to prove that it is not harmful to us.

Mr. Reid. They must consult the fish, too, before they make just judgment.

Mr. MARIENTHAL. Right.

Mr. REID. Could I ask Ora whether you are prepared to take phosphates out of detergents and whether your family and friends would do the same and use elbow grease, instead?

Miss CITRON. There are already two products available that either do not have phosphates in them or are so minor in phosphates that the level is almost negligible, having 100 parts per million of phosphate content.

Mr. REID. NGA-4?

Miss CITRON. No. One is Amway's L.O.C. nonphosphate cleaning agent and a Shakely product, one a cleaning fluid and one for laundry. Neither one are detergents or soap. Yes, I am prepared. I have got my family buying it and I have got all my friends doing so. I am distributing it.

I would like to address myself to your question to Ron, what the Government ought to do.

It is my feeling that, first of all, I did—you know—make short reference to States' rights. We have a very clear problem in government, it seems to me, in that same vein. "Well, I've got a piece of this; I've got a piece of that." We are all one very small piece of an entire world. In regards to government being allowed to license major industry, we cannot allow that to happen where we have any implication where such licensing can be detrimental.

Concerning the Santa Barbara leases. The State has a moratorium right now, for State tideland waters. The Federal Government continues to allow drilling in the Federal waters on a fault line in the Santa Barbara Channel, where there is approximately one blowout per every thousand wells and approximately 70 wells per platform and three platforms per lease.

Mr. REID. Would you ban offshore drilling in AEC powerplants and remove the authority for approval of powerplants from the promoter, in this case, the AEC?

Miss CITRON. I certainly would. I would remove powerplants from water areas wherever possible. I understand that there is one and a half, I think it is, billion dollars' study being discussed by the Federal Government, to allow study of sewage discharge in marine waters. And the people who are doing the study are the dischargers. That is a kind of insanity, to me. There has got to be objectivity. And I think that the thing that disturbs me is that we insist, in this country, specifically—and I cannot talk about anywhere else because I do not live there——

Mr. REID. I agree.

Miss CITRON. That we have to move "forward" quickly at all costs. Bigger isn't better, nor is a fast pace. Progress is very quick, here.

We live in an age where somebody, I was reading, was saying, "Well, when I was a young man—boy—and I lived to manhood, there were very few things, major changes, in my lifetime. Now, I'm only 21 years old and I can reflect upon changes in this city several times over, or in the marine waters."

We have to start taking an attitude that it would behoove all of us in our own best interest, to examine carefully before stepping forward; and we haven't.

Mr. Reid. I agree.

Mr. Brestoff. I would like to add one thing to both of those.

I guess the prime nut or kernel of the ethics that evolves here coincides with the economics of any one of these problems, where to build a plant, how to build it, it is complex because we have never had to deal with this problem before—of an individual action affecting many people.

So far, it's been relatively cheap to pollute. It is an individual gain to throw your trash away and it is a shared loss. It's the recognition that this shared loss is building up and beginning to affect everybody.

Mr. Reid. That puts it well, I think.

Mr. Brestoff. It is this kind of regard and consideration that has to be taken as the ethical base of our racing-dread world.

From that point, we begin research and education.

Mr. Marienthal. I wanted to add, what I feel it comes down to is, what is our definition of the quality of life?—How many TV sets we have? How many cars we have? How big our house is or how clean our air and water is; how many forests do we have?

At this point, I think it's the latter of the two because the first one means death.

I have heard that the average lifespan in Los Angeles is?—what?—20 years less than the average lifespan for the country. It is like under 50 while the rest of the country is 70, because of the smog in the air. This does decrease the amount of years in your life, if you live in Los Angeles your entire lifetime.

These kinds of things are frightening, but people still are grading the quality of life in the material—these very material things.

This is what technology is bringing us: Keep putting pressure on the manufacturers to use more and scoop out of the mountainsides and get more materials for these items. All of a sudden, it's just going to pile in on us. The reports on how much trash and waste there is, we can't find places to put it now, there's so much of it.

Mr. Reid. I think you are touching at the heart of the problem. And the other part of the problem is getting appropriate political response so that we do something while there is still time.

Miss Citron. I think what we are all saying in one way to indicate the level since we are talking about education, to which—and, again, the philosophy is very longstanding—the difficulty we have is that in this country, when it was built, we started on the east coast and when we got finished using up what we thought was good there, we kept moving forward. It's this whole idea of, "Go West, young man, go West": and where do we have to go? It's a very difficult tenet to change because that's what we're taught in civics: "Go West."

Mr. Brademas. Mr. Bell.

Mr. Bell. I want to add my commendation to Mr. Eber, Mr. Brestoff, Mr. Marienthal, and Miss Citron. Very good statements and good handling of the questions.

Miss Citron, you have mentioned something that I am rather curious about.

I agree with you, provided there are certain mechanical things that you are aware of or that I am aware of in the Santa Barbara Channel matter.

As I understand that situation—see if my facts mesh with yours—the State land commission had a casing program for those wells. It was the Federal Government that did not have the same casing program.

Miss CITRON. That is right.

Mr. BELL. In other words, the State land commission required that you would drill a well down to 2,000 feet and cement it and if the casing program had been fulfilled in the Federal lease, this spill never could have happened.

Is that your check with the facts?

Miss CITRON. Up to a point, yes.

State requirements have always been more rigid than the Federal Government's. It has not been proven, however, that the casing in itself would have prevented the blowout because there are blowouts—as I have indicated, there is approximately one blowout per every thousand wells and that is combined State and Federal waters. There was just not anything as big as Union Oil's platform.

Mr. BELL. I am not trying to belabor the point. I would agree with you that if there is no mechanical procedure that can be followed to prevent blowouts, they should not drill offshore beyond 3 miles or anywhere where there would be chance of pollution. I am not certain there is a mechanical effort possible. You can telescope casing down——

Miss CITRON. The first thing is that it lies on a natural fault line. There is a fault that runs along there and there is nothing that has shown that the pressures of drilling, and, certainly, on the massive scale that is done in that channel, with such casing could prevent blowouts or some other kind of disaster.

And the second point: There has always been natural seepage in the channel that's been recorded since at least 1850, so that you're playing with a very, I think, shakey basis and I think we have to show—I mean, I think there are two things to consider, there.

One is, we are facing a very severe air pollution problem caused largely by emissions from gasoline powered vehicles. How necessary is that oil to us in the channel in such areas? Is it not possible to provide inland leases other than in Alaska where they are destroying the Tundra? Is it necessary to provide them with the lease just because they can afford it and maybe the State thinks it can use its revenue sufficiently?

Mr. BELL. You are raising some mechanical questions. I am not sure that is accurate, as far as I know, that the oil comes up to a fault line.

There is a very shallow area, maybe so, but at that depth, I question that. But nevertheless, that is a technical thing and I would certainly agree with your position if these mechanical things cannot be done to solve the problem.

From the standpoint of the broader picture, obviously the Nation needs oil to keep up production, to operate mechanical equipment.

I would certainly concur that if these technical things cannot be done, stop them. I would think they should not build any wells if mechanical safeguards don't work, but I am not certain that proper precautions cannot be used.

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Mr. Brestoff. I would like to get back to more of a discussion on the particular bill.

In my presentation, I tried to get across ideas of community research in conjunction with universities as component part of education. I did not really see this in the bill. I would like to know your thoughts about this.

Mr. Brademas. Will the gentleman yield?

Mr. Bell. Yes.

Mr. Brademas. I would have observed, Mr. Brestoff, and shall now do so because of your comment, that your testimony was mostly predicated upon the assumption that this bill includes support for environmental studies programs at the university level. That is not the case. The bill is principally aimed at supporting environmental studies in elementary and secondary schools and through community conferences and adult education programs.

Mr. Brestoff. I realize that.

Mr. Brademas. This is not to say that your suggestions were not very perceptive ones, nor is it to suggest that at some point in time, we ought not to consider support in environmental studies at the university level, except that one of the sponsors of the bill made a judgment that it was at the elementary and secondary level and community level that it was necessary to make the initial thrust.

Mr. Brestoff. I realize the thrust of the bill. I did see, a number of times, mention of colleges, though, in the bill.

Mr. Brademas. That is primarily for teacher training, for curriculum development.

Mr. Brestoff. Then, I think it is a mistake. I don't think you can justifiably leave colleges and universities out because when students get into the universities, there is a high level of intense involvement with study and they are together there with faculty, professional people. Together, students and faculty could beneficially work with community organizations, and mutually——

Mr. Brademas. If the gentleman would yield further, I am not quarrelling with you about that. You know, there is a case to be made for carrying on a wide variety of educational activities but we just cannot do them all in one bill and I would go further and say that I have been impressed by my own discussions with people who were concerned in this field that if we have scarce dollars, the funds ought to go first to the elementary and secondary schools.

If you have read the Steinhart report, which I am sure you have, you will note that they do not suggest, necessarily, that we need to establish brand new programs of Federal support for getting environmental studies going at the university level but that, rather, moneys can be taken from existing Federal programs to aid higher education for that purpose; and, moreover, the principal thrust of that report is that you need multidisciplinary attitudes, which you said in your statement. That does not necessarily mean that we have to pass a bill for that purpose.

Well, I do not want to get off of the subject, here, because I am concerned that I have taken the gentleman's time, and I will yield back to him, too.

Mr. EBER. A question: Does this bill fund teacher education programs in the colleges?

Mr. BRADEMAS. Yes.

Mr. EBER. What I was getting at was a long-term problem. I think that is, maybe, my most important thing: instilling something in the people in the lower grade levels and also by providing teachers with the training so they can do this teaching. In the colleges, presently, you know, people will be coming up with what I call the short-term solutions or the short-term problems: immediate technology or whatever, but for the long term, maybe this bill works out to be the best thing because it is reaching the younger people and getting to them at an early age, which is very important, in that area.

Mr. BELL. Your project called ACT is, of course, a very interesting one. Do you suggest a similar format to be built into an educational curriculum?

Mr. MARIENTHAL. I would like to see that. This is what I am advocating, at this point. Our elders were never faced with these problems; and that the education system is a place where these problems can be taught and it is now a job of the students to relate these problems to the community because the mass media and all the assemblies and programs won't cover it completely.

You might not get all the community to come out but I have seen success when I have had my students set up tables in front of department stores and grocery stores and people come up and talk; people that normally wouldn't even listen to the news or tried to be disinterested as to ecology—You know. They have already written it off as a fad or something—are now talking with these students and they find that these students know their information. And I am trying to make sure that the students research as much as possible. I would like to see that the schools would give them all the education they need so they won't have to be forced to take so much upon themselves and then, they could relate it to the community.

Mr. BELL. Mr. Chairman, I have one more question. Do you think—this goes to any student that wants to answer this. Do you think that courses in community action, governing government should be included in an environmental studies program?

Mr. EBER. Yes, I was just going to comment on that, that in this environmental education, if you teach in a room like we are presently in, the battle is lost. We have got to get people outside to get them to appreciate the natural surroundings and it is very important that you get into community action. You can't just fill us all up with book learning. You have to provide us with a channel to live what we are learning or to practice what we are being preached about or what we are preaching, ourselves. You have got to get out and give people a way to do something. If we sit and keep learning about the problems, that's not going to make it. We've got to be able to effectively do something.

Mr. BRADEMAS. Mr. Hansen.

Mr. HANSEN. Thank you, Mr. Chairman.

Let me also express my appreciation to all of you for what have been really remarkably perceptive statements identifying, I think, as effectively as any we have seen, some of the underlying ethical considerations involved in this issue.

I think you have also, by your work in the various organizations that you represent and by your appearance here, demonstrated, the wisdom of the judgment of those who have drafted this legislation in assigning a role for private organizations in this educational process.

You have obviously been able to tape the enthusiasm and the idealism of the students in enlisting their help in this cause. You have helped to make the point that there is an important role to be played by noneducational institutions and nonpublic institutions, in this effort.

I would only ask one question, although I am tempted to open a wide range of areas because you have touched on some rather exciting aspects of the problem.

My question relates to the international aspects of the problem. I think it is obvious that we are all going to survive on this earth or none of us are going to survive. I think more than a generation ago, a lot of the Earth Day activities were anticipated by Van Loon in his "Geography" when he described us as fellow passengers on the same planet with a responsibility for the well-being of all of those that inhabit the earth.

Let us assume that we achieve zero population growth or maybe even less, in this country, which would then permit those who were still around to pollute a little more than they would be able to do otherwise.

What do you do about India and China? What do you do about the other countries that are striving now to achieve some kind of industrial growth, to gain the kind of a standard of living that we have indicated is so important?

What kinds of mechanisms can we utilize and what will our role be, in trying to achieve the kind of international cooperation that we must have to be successful?

I can see that you have thought about the question so I will yield the floor and, let you comment.

Mr. BRESTOFF. Yes. It is a big question but there is no doubt in my mind that a few important steps could be taken, given the will and the money and the priority. They are: information gathering, education, resource and food redistribution, and an end to strife via political nationalism. Regarding our position, we must move cautiously, with understanding. I think it has been the experience of people in other countries that our technology cannot be overlaid upon them.

Certainly, considerably more information gathering needs to be done, especially in underdeveloped—sometimes called never-to-be-developed—countries. Population statistics, for instance, are very hard to come by in China. The speculations differ by as many people who presently live in the United States. Information is needed to provide accurate physical descriptions of the world population-resource-pollution totality. There can be no comprehensive solution without more knowledge.

It has also been suggested that world priorities be rearranged for an easy redistribution-of-food system. Since so many are malnourished, it seems criminal to subsidize American farmers for intentionally not bringing good land into production. Economic barriers need dismantling, with the consent of all nations for the benefit of all nations. Any one that deviates should be boycotted by all the rest. In the meantime, international agencies should seek out areas where the least amount of food can do the most amount of good, and seacoast cities, destined for future population density, should have an internationally agreed upon limit, to prevent the ills of crowding, stress, pollution, and slum housing.

At the same time, educational and informational systems need to be established to diminish the existing disparity and to raise the spirit through knowledge and by feeling au courant.

Above all, I would say, we need some universally recognized, equitable, and strong world government. Earth and not individual nations should be the focal point of allegiance.

C. P. Snow and, independently, a Russian scientist, Satharov, have said that they fear the world will be buried by environmental problems unless the United States and the Soviet Union bury the hatchet. It is imperative that the pacificism of Gandhi and Einstein be recognized.

And I would say here that a comment about the conflagration in Cambodia and Vietnam are very relevant. The defense budget is ridiculous in consideration of the fact that no constructive good is accomplished by the expenditure of so much money. We simply wipe out other people, wipe out other lands. The defoliation of Vietnam is a good example of longrun ecological catastrophe performed for military advantage. In general, destructive projects must be abolished before constructive efforts can safely occupy the thoughts of the world's citizens.

Mr. Reid. I might just interject that I have introduced an amendment in the House to preclude the use of U.S. ground combat troops in Cambodia. If that appeals to you, you might support it.

Mr. Brademas. The Chair wants to suggest that that may be a very good point at which to conclude, if that is agreeable with the gentlemen, because I am fearful that we are not going to get a chance to talk to some of our other witnesses.

I do want to tell you how much we have appreciated your statements.

I was especially interested in your suggestion, Miss Citron, if I understood you right, that students ought to be more involved in helping themselves teach and I would take it that you would be sympathetic to the idea that is provided in the bill that funds would be used for private nonprofit organizations like some of the ones that you represent.

Thank you very much for having come.

The next witness is Mr. Gladwin Hill, national environmental correspondent, the *New York Times*.

STATEMENT OF GLADWIN HILL, NATIONAL ENVIRONMENTAL CORRESPONDENT, NEW YORK TIMES

Mr. Hill. The job of rehabilitating our environment, I think, is one that can be done only through mass action with mass support and that implies mass familiarity with the intricate details of environmental problems.

The degree of public ignorance today is appalling. Environmental quality begins at home and most people have no idea of where their local sewage plant is let alone what sort of treatment it gives to sewage.

Most people have no idea of the amount of chemical treatment it is now necessary in most communities to give to drinking water to make it safe and palatable.

Most people who help pollute the atmosphere with their automobile couldn't tell you the three main chemical categories of exhaust emissions or the statutory limits now in effect on these exhaust emissions.

Most people, I would venture, couldn't tell you within 1 billion, the population of the world, or its rate of increase, although this is a matter of critical importance.

These and thousands of other facts about environmental problems are going to be as vital for citizens to know as anything beyond the multiplication table and the ability to read and write.

The urgent need for this knowledge implies one of the greatest educational efforts of all time which I am sure is the motivation behind your bill.

This effort will need to use every available channel of communication, particularly the educational system and the mass media.

This, in turn, implies something of a revolution in education.

Elementary school is not too soon to start teaching children about environmental problems, not too soon from the standpoint of importance of the subject or from the standpoint of children's understanding.

Even the remarkable successful public television program, "Sesame Street," aimed mainly at preschool children, is touching upon environmental problems.

But making environment a new integral part of educational curriculums at all levels will be as massive a job structurally and organizationally as if language or mathematics were being introduced for the first time.

It will need all the help that can properly be provided by the Federal Government.

I hope that any program of Federal assistance in environmental education could avoid the pitfall common to many governmental programs, the dissipation of money and energies on administration of the program itself rather than direct application of money and energies to the final objective.

I would hope, too, that the sponsors of this bill could devise some miraculous formula for dispensing funds that vis-a-vis the States would avoid a sort of Scylla and Charybdis that has been alluded to today.

Federal grants to States really need to be on some sort of matching fund basis so they will not just be a handout and the States will have a real incentive for involvement.

On the other hand, as Miss Citron has pointed out, it would be lamentable if a State could negate the national effort simply by refusing to pony up its share, so I am counting on congressional ingenuity to come up with a grant program that will hopefully impress even our less progressive States with the importance of participating but if they balk at getting the message, will pull them into position directly or indirectly of assuming some sort of economic penalty.

The mass media will be the main channel of educating people outside of school and college structures.

Newspapers, broadcasting stations, and magazines certainly can use some stimulation and information.

My opinion and that of others in the news business is that any sizable newspaper or major broadcasting station needs a full-time environmental specialist today just as much as it needs a man in city hall, on the police beat, or sports.

That is far from the case, today.

I would guess, as far as I know, in the field of newspapers, out of a couple of thousand daily newspapers in this country, there are probably not more than a dozen or two that have a full-time environmental reporter.

That limited extent of coverage may give an idea of the problem that confronts you in just educating the media with which you hope to educate the public.

Your bill bothers me a little on one point that I trust is a matter of semantics. That is where it says grants should be made, "for preparation and distribution of materials suitable for use by mass media in dealing with the environment and ecology," unquote.

To some people in the mass media, that might conjure up pictures of governmental agencies cranking out prefabricated news material to be plopped into publication or broadcasts, raising the old bogey of Government propaganda.

No one should lose sight of the fact that while rehabilitation of the environment is, like motherhood, something everyone is in favor of, nearly every phase of this rehabilitation has aspects that are political and controversial.

Nevertheless, there is a vast body of factual information that needs to be conveyed to people about environmental problems before they will be in a position to even start arguing intelligently about them.

That area of factual information, just as antiseptic and clinical and objective as census information, is the sort of material on which any Federal agncy would be well advised to concentrate as far as the mass media are concerned, if the agency does not want to find itself in the midst of the same kind of tempest that has arisen over sex education.

Some sort of active publishing or distribution of objective information might be found workable but I can think of several other means that could be utilized, as well.

One would be the development of an information center on which the media could call for—voluntarily—for environmental data as individual organizations want it to.

That would lift the stigma of propaganda being planted.

And there is a great need for a recourse—resource—like that, today.

Another useful device would be the background media handbook.

One reason the public has gotten a very detailed amount of the Apollo program is because early in the game North American Aviation here in Los Angeles, in collaboration with other major contractors, turned out a very well-produced, well-indexed looseleaf background factbook distributed to writers and editors, that could be updated periodically. And this was done, I would note, without getting into any of the controversial areas of the Apollo program.

Another device which has been used successfully on a small scale—and I do not know why it should not be used a lot more in educating the media of public problems—is the symposium, a national or regional gathering to which selected executive editors and reporters or, for that matter, any other professional categories of people—educators or people in government—a meeting to which they are invited at which topnotch experts brief them on the latest information in a field and there is an opportunity for extensive two-way discussion.

An example of this is a thing that the American Cancer Society does almost annually. They hold sessions of from 1 to several days around the country where there are concentrations of cancer experts and cancer research. They regularly come to Los Angeles. And qualified reporters, science editors, national and local, sit in on as many of these sessions, going from place to place, as they want to, so you have sort of a revolving group. You hit the large media as well as the small or, at least, you give them an opportunity. This is a very relatively inexpensive sort of operation. The reporters pay their own expenses. The main cost is that of organizing the sessions. These tours, I know, have contributed greatly to media understanding and public understanding of the facts of cancer. There is no reason why the same format could not be adapted to the even more important realm of environmental problems at a minimum expense to taxpayers. But I do not close the door on any means of disseminating information. We will need every means we have to really come to grips with this critical problem of environmental degradation.

Mr. BRADEMAS. Thank you very much, Mr. Hill. It is a most useful statement and I am particularly struck by some of your specific concrete suggestions such as that of the information center for the media and the symposium and handbook of information.

In essence, it seems to me what you are suggesting for the media is something not unlike what has been suggested for teachers, of environmental studies especially at the elementary and secondary school level where there might be symposia or institutes, as they have come to be called, for teachers.

It has also been suggested that, in Washington, at the U.S. Office of Education in the Department of—or the section that would deal with environmental education, there be a central repository of teaching materials which could be made available to school systems all over the United States or to private nonprofit organizations of the kind represented by some of our witnesses here earlier that might wish to undertake support of such studies.

Is that—did I misstate what you have in mind?

Mr. HILL. No; that is what I had in mind and the thing could be enlarged as much as you want it. I would not be frightened at the idea of a large building in Washington with some sort of an agency acting as an information center, on this vital area.

It could be enlarged even beyond the media, to the point where citizens could go. I am very conscious of the fact that we have, as a nation, some tremendously momentous decisions before us in the years immediately ahead, things on what are we going to do about population, the internal combustion engine, and unless decisions, needless to say, are backed, supported by and involve a great mass of public understanding, the understanding of people in general, they are not going to be valid, they are not going to stand up.

Mr. BRADEMAS. Well, I appreciate that.

I just have one other point.

I share your concern that we encourage the States to play an active part in supporting these programs. It is very often the case when Federal grants are available, that the States, especially States, I find, where the leaders are most vocal in their championing of the States' rights doctrine, do not really care to practice States rights if it means involving the infusion of State tax dollars in the programs. They want Uncle Sam to pick up the tab.

I forbear making any personal allusions, having said that, but one way in which we might meet your concern and still be realistic—and I really had not thought about this until you mentioned it—is that we might say that we will start off by making the grants directly from the Federal Government to local communities, private organizations and schools and all of the other eligible authorities but that after a period of several years, the Federal funds would no longer be available on a hundred percent basis but there would have to be some sort of matching by recipient organization. I do not know. I am thinking out loud and I, frankly, am not too enthusiastic about my own suggestion there but if you have any comment on that——

Mr. HILL. No. I think that would be a good entering wedge, for one thing, one way of getting it moving.

Mr. BRADEMAS. Thank you.

I would call on your fellow journalist, Mr. Reid.

Mr. REID. Mr. Hill, I am delighted to see you here. I think you have been very much to the point.

On this last point, I think it is clear we need a bypass mechanism and, equally, there should be a penalty mechanism. Today, there are 400 counties that refuse to take either food stamps or surplus food and I think we have got to address ourselves to that point.

I think your ideas on the information center, a fact book, periodically updated, symposium tours for reporters, with some expenses shared, I think that is all very useful information. I would like to——

Mr. HILL. Excuse me.

Mr. REID. Certainly.

Mr. HILL. On the—as you know but many other people who are getting behind this effort do not, that it is so important in galvanizing the media on something to hit that executive level. It's not that these people are dumb. It's that they spend a good deal of the time of their work in managing the media, directing them, they are insulated and sequestered from some of these everyday problems and when you get some of these editors and executives out at the symposia where I have been, it is remarkable the way their eyes bug out, when they hear about some of these things for the first time and then, they really get behind a thing and the word goes down fast. You know how it is on a newspaper: When the word gets down below that Mr. Big, upstairs, is interested in something, people pay attention to it.

Mr. Rees. I think that is exactly right.

The only other question I wanted to touch on in a little greater depth is the overall question that you talk about: that there is vast public ignorance. You say that the time we have on the globe during which it may be habitable is perhaps 30 years. I have heard as short as 10. In certain points of the country, I agree newspapers and editors have not focused attention on it. Do you have any guarantee for a news hole?

Mr. Hill. At the moment, we are having a little trouble of guaranteeing getting a newspaper out tomorrow.

Mr. Rees. I am not unmindful; but, basically, has there been any effort by the Times or other papers to recognize not only the expertise that you have developed but the whole field of environmental news reporting, environmental law and the need for some kind of—I would not say regular allocation of space but some understanding of priority dependent on the news value, some understanding in the Sunday papers, as well?

Mr. Hill. Oh, yes. It has not—it's something that is so big that nobody's bothered to spell it out, really, awfully explicitly, but it's something that occupies us every day and, of course, every day in the paper, we will have several environmental stories.

Mr. Rees. I think you have done a remarkable job, myself.

Mr. Hill. Thank you.

The big problem is the coordinating of coverage, and that is something we work on all the time.

Mr. Rees. Could you touch on just one other idea? You find so much and such vast public ignorance in this field because it is very clear that people just do not know that the life systems of air—they do not know and how they may only have 100 feet above them. They do not seem to know that it is now global and that pollution here goes all the way to New York. We are now the worst, in that.

Mr. Hill. I think the reason is just because it is such a huge field and it is so complex. If you just even take the tiny field of automobile smog, you get into tremendous complexities there, and other areas are equally formidable and this is something that just hit the public about a year and a half ago, I think.

I think of the Santa Barbara oil blowout as sort of the Hiroshima bomb of the environmental revolution. It somehow or other for no real logical reason, it dramatized and brought home to people things that John Muir had been saying as much as 70 years ago, that you would pick up anything on earth and you would find everything else hitched onto it. So people have had only really about 18 months to start thinking about these things and heaven knows, back in the days when we were going to school, you were not given much explicit education in this sort of thing. So they have had a lot of catching up to do, on their own time, and really not much way of doing it which is—you know—does what you have in mind and why you are here.

Mr. Rees. Well, I just want to thank you for your suggestions which I think are excellent and if it is now fit, you might even try to stick in the words, "editor and publisher," somewhere here, as well as "working reporter."

Mr. Hechler. Mr. Bell.

Mr. Bell. I have no question. I just wanted to welcome my old friend, Gladwin Hill, before the committee, here. I have known for many years of your great work in the news media field, particularly with the *New York Times*. It is a pleasure to see you here.

Mr. HILL. Thank you.

Mr. BRADEMAS. Mr. Hansen.

Mr. HANSEN. Mr. Chairman, let me also express my appreciation for what I think are some very helpful specific recommendations concerning the implementation of this bill.

I would only raise a question that grew out of our hearings yesterday, to solicit your comment.

Some of the witnesses in San Francisco made reference to educational programs that are being undertaken by many of the corporations through advertisements in the mass media, calling attention to the contributions they are making in cleaning up the environment. Many of the observations made by the witnesses who addressed themselves to the subject were to the effect that much of the material in the advertisements is misleading and inaccurate and designed apparently primarily to clean up the image of the corporation. In our discussion, we focused attention on the responsibility of the media itself in trying to—and advertising agencies—in trying to develop some kind of basic standards that might be applied. I would be grateful for your comments on this problem, if you think it is a problem, and on what you think the newspapers and the media generally can do to help contribute to the dissemination of accurate, balanced information to the public.

Mr. HILL. Well, I do not think that, generically, you have a different problem here from what you have always had with corporations tending to put their best foot forward or advertise their wares. They have always done that, in advertising. They have never told you about the labor troubles or the financial troubles or the stuff that was behind the facade and so it has always been up to the media to bring out both sides, really, on the financial page, to tell the story of their financial pros and cons and vicissitudes and, on the news pages, to deal with things like labor troubles and that sort of thing.

I think this can be carried over into this area. I can't foresee big corporations—Certainly, they are gilding the lily, right at this moment, a lot of them—I can't see them becoming really mendacious about the business because it would be very bad public relations; but if they should, there are two areas where it can be hit.

One is most sizable, sophisticated newspapers are quite discriminating about sifting out misleading advertising. In the New York Times, for instance, somebody can't even say that they have the largest, the biggest sale of fur coats in history unless they can affidavit it. So you would get into exaggeration, that way.

And then, your other safety valve is putting the things in proper perspective in the news columns, which is our constant struggle all the time, and I think we are up to it, but we have—we are up to it in principle but we just have a huge job ahead in terms of volume.

It's like the Edison Co. down here in Los Angeles has struggled for years to get rid of objections about the stuff coming out of there. Well, the stuff comes out at the rate of somewhere between 400,000 and 1 million cubic feet a minute and that much volume of anything is just almost impossible to deal with, but ways can be found.

They are finding the only way you deal with a thing like that, you can't treat anything that comes at you 1 million cubic feet a minute; you've got to change where you start in the beginning by putting in a fuel that is not so obnoxious.

We will have to narrow things down on the informational side the same way. And that is something that at least on the Times, we are worrying about and talking about, conferring about and planning about all the time, is how do we get this story across in the most—in a way that is meaningful. How do we cover the bases? At the same time, how do we not spread ourselves too thin and confuse people.

I think it is about the biggest challenge that the media have ever had. I mean, it makes covering a war relatively simple because this is a huge thing, far bigger than a war; it is going to go on as far as we can see ahead.

Mr. Hansen. Thank you very much.

Mr. Rosenthal. Mr. Hill, just following what you have said, I cannot forbear making one other point. I guess I really do not—though I find myself in agreement with most of what you have said, I do not really find myself in agreement with your last point with respect to—if I understand you correctly—to the lack of mendaciousness on the part of, to quote you, many industries and to the—and, also, I—I do not believe that. I think it is quite clear on the record that a lot of industries do lie. I should have thought that one of the contributions that Ralph Nader has made to the public is to point out that the claims made by many of the automobile producers in the United States about the safety of their cars and so on quite obviously, by virtue of the fact that so many of them, after the Congress passed a law requiring certain safety standards, had to turn them back; that the revelations with respect to a number of the representatives made by American pharmaceutical manufacturers about the drugs that they produce have been—have made clear that—have made it very clear that they have been lying to the American people about what their drugs could do and could not do.

I do not pretend to be an expert in this field but I do not really think you meant that, did you?

Mr. Hill. No, I was thinking more in the framework of Mr. Hansen's question about advertising. Specifically what I was thinking is that a big advertising agency is going to think several times before they put an outright misstatement in an ad where it is conspicuous.

I think the big problem we have to deal with is along the lines of what you were saying that the biggest problem is the big lie which is not expressed specifically on a given piece of paper, at a given time. To me, the big lie that American industry has been putting out either directly or indirectly, consciously or subconsciously, doing it for some time, is the notion that it is exerting itself on this field of pollution control.

The National Industrial Conference Board just came up with a figure that industrial outlays on pollution controls for last year, 300 major corporations, which pretty well covers your big ones—was $300 million. Well, that is ridiculous.

Mr. Rosenthal. Perfectly.

Mr. Hill. You take this and relate it to gross national product, you relate it to value added by manufacturing or any other economic yardstick and it is ridiculous. It is no effort at all. And that is something that has to be spotlighted, and we intend to do it.

Mr. BRADEMAS. I agree very strongly with what you said but I cannot resist being contentious one more time. I do not at all agree with you that advertisers in this country refuse to advertise products with respect to which representations are—misrepresentations are made.

Yesterday, we heard from a prominent advertising agency head here and he made very clear that most advertisers in the United States—by which I mean people who are professional advertising agencies or professional public relations agencies do not really have—there is no standard, there is no code by which they make an ethical judgment on the issue of whether or not the client's product is an honest product or not. They just do not. They advertise the product.

Mr. REID. If the chairman would yield, at that point——

Mr. BRADEMAS. Yes.

Mr. REID (continuing). I would add to that that I think two things. One, I think there are certain industries, as a whole, powerplant industry being one, the oil industry another, who frankly are claiming that they are doing something about pollution when, in fact, they are not and in some cases are making it worse.

The question that I would raise here is: Should the major newspapers now take a look at what you call the oversimplification and the big lie?

When an airplane manufacturer says they are retrofitting jet engines and have solved, to some degree, the pollution problem by removing soot but, in fact, what they have done is break it up into particles you cannot see which will now stay in the air for 4 or 5 years and, therefore, they have actually made the problem perhaps worse, I wonder if newspapers now have a responsibility to look a little bit back of this question of when they rather glibly say they are building a safer car or that power is going to be clean or whatever they may say.

Mr. HILL. Oh, absolutely. I would agree with you there and I would not disagree with you at all on—again, I was thinking in terms of, you know, really specific misstatements but the——

Mr. BRADEMAS. No; I am not talking about robbery in broad daylight, at noon. I am just talking about what is very often standard operating procedure. I do not think we are in disagreement, Mr. Hill

Mr. REID. No.

Mr. BRADEMAS. I want just to conclude our questioning of you here by expressing our appreciation both to you for the pioneering work that you have done as a journalist in the entire environmental field and pay a tribute to the *New York Times* because the *New York Times* helps set the pace for journalism in this country and on your great newspaper, out on the frontier, hopefully, you are going to induce others to follow your leadership.

Mr. REID. I might just add that I share that view, from what I know of your pieces in the Times. But also I make some plea to you that there are some trends abroad in the land that are worrying and I think the Times and other great papers have got particular responsibility to keep telling the truth irrespective of whether reporters' notes are seized or particularly as some of the networks are now being frightenened, so I hope that, if anything, you will continue your leadership and make it more explicit. A lot rides on both your accuracy and the courage.

Mr. HILL. Well, thank you. We certainly will try to.

Mr. BRADEMAS. Thank you, Mr. Hill.

Mr. REID. Thank you, Mr. Hill.

Mr. BRADEMAS. The next witness it Mr. Ted Watkins, of the Watts Labor Community Action Committee.

The Chair would like to ask unanimous consent that there be read into the record, prior to Mr. Watkins' statement, the text of a letter dated April 29, 1970, to the Chair from Mr. Watkins, in which he makes clear that he is testifying not as project administrator of the Watts Labor Community Action Committee but as a private individual.

Is that accurate, Mr. Watkins?

Mr. WATKINS. That is right, sir.

Mr. BRADEMAS. Pleased to see you here, sir, and go right ahead.

(The letter referred to follows:)

WATTS LABOR COMMUNITY ACTION COMMITTEE,
April 29, 1970.

Hon. JOHN BRADEMAS,
Chairman, Select Subcommittee on Education, Committee on Education and Labor, Washington, D.C.

DEAR CONGRESSMAN BRADEMAS: I am sorry to advise you that I am unable to testify before your Committee at the present time. As Project Administrator of the Watts Labor Community Action Committee, I do not want to jeopardize one of our critical funding resources—namely, private foundations.

The Tax Reform Act of 1969, page 29, section 49-45 D and E, makes it illegal for any organization receiving support from private foundations to, in any way, influence legislation or legislative bodies. I am sure that the Subcommittee members are very much aware of this legislation and can appreciate the need for my declining to participate in these hearings.

If, however, the committee has any questions to ask me as a private individual, I will of course be happy to cooperate.

Sincerely yours,

TED WATKINS,
Project Administrator.

STATEMENT OF TED WATKINS

Mr. WATKINS. Well, I guess after most of the things that I have listened to back here in the room, I begin to wonder when they really start applying to a community like Watts.

On the educational part, to tell kids in a school in a community like Watts about saving environment and the needs for conservation and all these things and knowing the conditions of the schools that they will be taught these things in, it seems to me to be a frustrating and fruitless effort.

There are three schools that I know of in Watts starting from the elementary school which has a pile of junk behind it. That's similar to me like the thing that happened in England when the mountain came over on the school and destroyed the students. That school is an elementary school on which to begin.

The next school down there is a school down the street, a little further, which is a junior high school which is backed up by industry.

And the high school, which is Jordan High School, is another school up the street further, that is also, on the east side of it, completely backed up by junkyards and industry.

I don't know how a kid can think in terms of the kind of environment we are talking about when from the elementary school until he graduates from high school, he is placed with the junkyards and the trash.

I can understand, looking out this window, what you are talking about when you say, "environment."

One of the things that we did in Watts was, back in 1966, we started what we call a conservation corps program, a community conservation corps.

Since that time, we have planted some 10,000 trees in Watts. We have built 11 vest pocket playgrounds in the community and we have taken land that was the right-of-way land for the power and water company and it was a blight in the community and changed it into strips of parks and growing flowers and vegetables under those power line mains.

We have an educational institution up in Saugus where we're taking kids out of Watts, as a matter of fact, 300 of them a week, and they go up there and learn vocational education 5 days and 4 nights a week and we felt that the only way we could make an impact on these kids is that we had to get them out of the environment of Watts.

So other things that we have done in the same area is that in 1967, we took 2,600 kids up to Camp Roberts, 300 miles away from Watts, and went through the summer of 1967 giving them that experience away from the community and out in the wilderness and also on the hottest desert, I guess, in the whole world, is that Camp Roberts place, but the kids enjoyed it. For the first time in their lives they've been out of Watts and out of those housing projects.

There are a couple of things that I have heard here also that I would like to make some comments on, because it begins to be a question of who is going to be sacrificed.

When I heard the name of Stephanie Mills mentioned here, the first thing I hear is the question of population explosion and who is going to begin to cut back on the population when in my instance, the—I have always been taught it's the majority rule in this country and if you're in a minority group, the only way you ever become equal to that majority is by continuing to explode, as far as the population is concerned. So in that case, I'd like to know what the rules are when we're going to begin to level this thing out that we can have a rule that says that for every household, there are so many kids, two to a family or something like that, when this kind of a majority rule still exists as far as democratic form of government is concerned.

One of the other things that I am very much concerned with and that is that this law, I think, in order to have its full effect, has to be oriented not only toward the institutions but also toward community action groups, because I guess the only reason we've done the things that we have done in Watts is because none of the institutions would function and neither would the——

Mr. Bell. Could you expand on that?

Mr. Watkins. Well, in the first place, when we started out, for instance, in the summer of 1965, we found that kids were placed out on the sidewalks and this is happening in all of the cities in the United States, with gates of schoolyards closed. Everybody seemed to go off someplace and leave these kids on the street. Federal agencies had geared programs not to problems in the community but basically to somebody's criterion for what they felt was needed. We started a program, in 1966, of how to involve yourself with the youth in the community who basically have the problem.

Headstart project was in effect but nobody touched kids 7 years old to 15 because there were no Federal funds available for kids 7 to 15 years old, so we felt that the basic problem in being in Watts when August of 1965 came, that the basic problem out there was youth out there on streets, from 7 to 15, were the first kids to throw the bricks and as a result of that, a number of others began to get engaged.

We involved ourselves in the Community Conservation Corps program, starting out one program for 300 which ended up with 3,000 kids.

We removed bricks and put rakes, hoes, shovels, and spades in their hands and began to clean up that community.

We began to find out who owned vacant lots in the community and found out that the city and the county owned most of the vacant lots because they had been taken over for taxes and we changed those vacant lots into vest pocket playgrounds where young kids living on the streets didn't have to walk ten, fifteen blocks across a couple of railroad tracks in order to get to a playground.

This began to involve the community in the supervision and the upkeep of those playgrounds.

In 1967, like I said, when we took those kids to Camp Roberts, again, the playgrounds were closed. We were faced with a growing resentment on the parts of the kids of having Detroit getting a bigger record than they had, so we felt that the only thing left for us to do was to try the experiment of removing the kids completely from that hot asphalt and so forth and we took them to camp.

None of the institutions have involved themselves in any of that kind of thing except when they began to have summer crash monies to do it.

Environment. Like I say, when you're talking to us about it, in one instance, people who can appear before this board have had all of the benefits of the environment of a community like this.

And then, when the problem of them having to locate a junkyard, for instance, and many of the people who own these blights in our community live in communities like this. Then, the only thing for them to do is throw them in. One of the largest junk dealers in the community lives here in Westwood but his junkyard is over there behind this elementary school.

I think these are parts of the problem. Educational process is going to have to take place not only in the school level but I think there has to be some way that the budget has to be tied with some way of improving the environment of where you are teaching that education.

To teach these kids about the beautiful things to save and there is nothing in that community to save, it seems to me like you're further frustrating them.

Mr. Brademas. I appreciate, as we all do, Mr. Watkins, your statement.

I believe I am correct in saying that you were quoted recently in Esquire magazine in a piece to the effect that it is pretty difficult for Blacks to get deeply interested in the problems of the environment because of the kinds of problems that you have been discussing with us here today.

I would simply observe that one of our earlier witnesses, Dr. Margaret Mead, the anthropologist, said that it will be difficult—in effect, she echoed what you have suggested when she said that it will, in her judgment, be difficult to get people concerned about how our country is going to look 50 years from now if people in 1970 are not sensitized to the fact or aware of the fact that we have got a lot of poor people and hungry people and people who are in poverty and are discriminated against in our society, right now. And she spread the hope, as do I, that the new concern about ecology and the environment and the shape of our society half a century from now will lead us to be more deeply concerned about problems here and now that face us.

I hope—I assume from what you said that we are not in disagreement on that.

Mr. Watkins. No, I do not think we are.

Mr. Brademas. Mr. Reid.

Mr. Reid. I would just observe in relation to that colloquy and both Mr. Brademas and I have long urged the implementation of the Kerner report and the major change put forth in the Kerner studies is an abolition of racism in this country. I think unless we do something in this area at the same time that we do something in terms of environment, that it will have less meaning. So I share your concern; and in our interest in the environment, we must not forget the other areas that we have neglected for hundreds of years.

I would certainly like to compliment you on the program that you mentioned for Watts, the importance of reaching the 7-to-13 year olds.

Did you have any specific suggestions on the bill other than the ones you mentioned?

Mr. Watkins. No. The only thing that I am concerned with in the bill is that I did not see in there where there was any implementation money or any provision in there to implement on the community level, after you educate or while you are educating, to do some implementation of the thing that you are talking about.

Mr. Reid. Then your point, as I understand it, is that absent some community projects and some action improving the environment, the teaching will be so remote that it will lack relevance to students in that kind of environment.

Mr. Watkins. That is right.

Mr. Reid. I think the point is well taken.

Thank you very much.

Mr. Brademas. Mr. Hansen.

Mr. Hansen. Thank you, Mr. Chairman.

I have no questions but I would just join my colleagues in complimenting you for a very fine statement and also for the leadership that you furnished in this area. This is what we are actually talking about. We are talking about the quality of life and the quality of the world that we live in.

I am grateful to you.

Mr. Watkins. Thank you.

Mr. Brademas. I want to make just one other point, following what we have all been observing, that I noticed with great interest, an article, I believe it was in last week's issue of the New York Review of Books, by the American economist, Robert Heilbroner, quoted by one of our witnesses earlier, entitled, "Ecological Armageddon." The whole point of the article which may have particular significance for a community like Watts or at least one point of the article was that the new concern about the environment in the United States and the way our country will look some years from now, over the long run, may become the basis for a new political movement, what Heilbroner called a "new New Deal," which will result both in wider—in a wider base of support for environmental protection measures and more—in the long run, and, in the short run, attention to the whole spectrum of issues that Mr. Reid and I were just talking about.

That might be an idea, a suggestion, a perception that would have particular significance, I would have thought, in a State like California.

Mr. Watkins, thank you, again. We are aware of the fine leadership you are giving in Watts and we are very grateful to you for having come.

Mr. Watkins. Thank you.

Mr. Reid. Thank you very much.

Mr. Brademas. Our next witnesses, I wonder if they would just be kind enough to come up just in tandem, if there is no objection, Mr. and Mrs. Leslie Reid. Are they here with us, today? [No audible response.]

Mr. Brademas. Mr. Marc McGinnes, is he here?

Mr. McGinnes. Yes; I am here.

Mr. Brademas. Are you ready to testify, Mr. McGinnes?

Mr. McGinnes. Yes.

Mr. Brademas. Come right ahead, sir.

Mr. McGinnes. Thank you.

STATEMENT OF MARC McGINNES, COMMUNITY ENVIRONMENTAL COUNCIL, SANTA BARBARA

Mr. McGinnes. My name is Marc McGinnes. I am from Santa Barbara. I, therefore, am one of the survivors of America's ecological Hiroshima, as Mr. Hill was saying, but don't worry too much about Santa Barbara. We're taking care of ourselves pretty well, there. I would urge my fellow citizens not to think too much about Santa Barbara any more but to look at their own community and see what the imperatives are in their own communities. The fact is that oil hit the beaches, hit people in the face and in the weeks and months that followed the oil disaster, we saw a response which is all too typical and that was to pick out convenient enemies and to say, "You are the polluters and we are the pollutees. We are suffering and you are the aggressors," without giving one whit of thought to how their life styles were maintaining this institution which can at its worst not only not serve them but can kill them.

Well, in the fall of last year, it became evident to organizations working in the area of environmental control that we simply had to stop talking about the oil spill so much and get down to more basic facts. We now have a fairly well organized and well run and well functioning community organization and it is this aspect of your bill which I would like to speak about, primarily.

I think that community organizations—this one happens to be a nonprofit, tax-exempt organization—need Federal funds and I think that, as Mr. Brademas was saying, only in the short term. Right now, there is a lot of lipservice about the—about ecology. It has been said that the Governor of this State devoted one-third of his state of the State address to ecological problems and one three-hundredths of the budget to that.

We are finding that at least in Santa Barbara that we are not having a great deal of trouble mobilizing the citizens as far as the devotion of a certain amount of their time is concerned but money is tight, the economic underpinnings of this society are slim and there is just not a lot of money. So we could and we do need Federal funds at least from the outset and I hope that these minigrants that will be available under this bill will be forthcoming to community organizations such as this one.

Again, I think that Santa Barbara probably won't need it. It would be bad for Santa Barbara to take such funds, as there is plenty of private wealth there, but other communities less well off will need it.

I know that communities across the land are starting to get hip; it is becoming clear that it's life style change that we're talking about, and they are forming up.

A lot of the testimony here today has been cumulative, naturally, and I suppose that in all of the times you have had these hearings, a lot of this stuff probably is getting a little bit old.

I would like to make a few comments, if I may, regarding some of the things that I have heard here today. I can't resist making my statement about them.

Mr. Chairman, you spoke of, "great cities," "this great city." Well, I trust that you were speaking in terms of a quantitative approach. This is not a great city.

Mr. Brademas. That is what I said, "demographic."

Mr. McGrews. Nor is any other city a great city which does not plan very carefully its growth, considering the factors of environmental capacity and quality. Now, very few cities have done this. It has got to be an educational process. I say the imperative is to hit adult education. I mean, if we are talking in fact, as Paul Ehrlich has written the scenario of the death of the oceans by 1979, we are not talking so much about elementary education. We are talking to the people who went through the depression, who have all kinds of different motives, different values, that have been seriously called into question by virtue of the changed circumstances that we are now facing.

Again, the Santa Barbara experience is, we have absolutely no problem with elementary and secondary education. Some of our best people in the movement are teachers. We have a devil of a problem with the older people themselves.

Mr. Bell. Could I ask, at that point, Mr. Chairman—

Mr. McGrews. Please.

Mr. Reid. You said the problems in Santa Barbara were not the obvious ones; to some degree, in a sense, you did not even need help; but you did say that the oil matter did not touch the life styles and I presumed you meant that the system was maintaining a drive for oil even though they did not say they wanted it spilled on their shore.

Mr. McGinnes. That is true.

Mr. Reid. Have you been able to reach that—get to the fundamental problem instead of just the pollution problem?

Mr. McGinnes. No; we have not been able to reach that state yet but, naturally, that is what we are driving for. A few, a minority, a definite minority even before the spill were talking about oil in Santa Barbara: Do we want Santa Barbara to become an oil town? It's completely inappropriate as an oil town. It is equally inappropriate for Santa Barbara to turn into a San Fernando Valley but that's just what is happening, right now, not because the students are not—are supporting something like this. It's because the people in power are—for example, there's a development 20 miles north of Santa Barbara. It's about 40 miles south of Vandenburg. It's between the two fastest growing areas in Santa Barbara County. Now, this development would put a community of a couple of thousand people in that area. Now, it's obvious what's going to happen. Growth is going to proceed toward Santa Barbara, from Santa Barbara, and Vandenburg, both ways. We are going to have a whole spill-out.

What's the primary argument in support of this? It's going to bring money to the county; it's going to bring new industry, new life. We need the revenues. Now, we really don't need it.

Santa Barbara has another alternative. We can keep our populace. We can keep our soft industry within the urban envelope that the county taxpayers have spent several thousand dollars on designing in a general plan. But these are the arguments, again, and they are in your heads; they are in mine. They are not in the kids' minds.

We have got to really get cracking on this, right away. That's what I think. That is, again, why I think that the most significant aspect of your bill is the adult education aspect in the community projects.

Feel free to break in at any time.

Mr. Brademas. Let me just ask you, at that point, how would you go about using—you were suggesting that you did not really need Federal money in Santa Barbara, but let us forget the source of the money, for a moment and ask how the money would be expended.

Mr. McGinnes. Right.

Mr. Brademas. In an adult education program through a minigrant of some kind, who would do the teaching and what kind of teaching materials would you use? Where would you get them?

Mr. McGinnes. Well, in Santa Barbara, within the next couple of weeks, there will be a center—this is where the money would go—a center housing a library, a reference library, a book store, a film service, a center perhaps not large enough to have conference facilities on it but a center which would have the capability in terms of resource people on a volunteer basis to teach environmental studies on a workshop field trip basis.

For example, this summer in Santa Barbara, because of the economic plight, there will be no summer school for the children of Santa Barbara, so we are meeting that need through the community ecology center in taking as many of the students as possible in kind of a private educational institution on 2-week field trip-workshop programs in environmental education. Where are the teachers coming from? There are teachers in the high schools who won't be teaching, this summer. I don't think there will be any problem in getting qualified people to teach environmental awareness because that's what it really is.

Let the technical aspects be taught, you know, later on or in another kind of a structured atmosphere. What we're trying to teach is environmental awareness. This can be done in your local supermarket where you walk through and say, "Now look at that. Does anything strike you about that?"

"Yes. What do you need all that metal around a canister of male deodorant for?"

"What else strikes you?"

"Why do you need so many male deodorants?"

You know.

And this whole thing is cumulative. You start asking; you stop demanding, "I want, I want, I want," and say, "What do you really need? What is enough?"

Another point. You know, the cowboy economy we have kept. We have been moving west and some say "now we find ourselves without frontiers." Well, that's not true. We still have a lot of frontiers. The question is whether we will continue to exploit the frontiers at the expense of other peoples. We have moved so far west that we have crossed the Pacific Ocean and now, we're in Southeast Asia.

That war has been supported by some people as a means of protecting our markets and this is something I am sure that is in the record, already. One-fifteenth of the world's population, of the world's people, 40 percent of the resources, but we are going to continue to grab more than our fair share in the world or are we going to research, redefine our values and survive?

Congressman Hansen said that he thought it was beyond question—he said that there was no doubt that we would either all survive or we would all perish. I feel that some of us will survive; some of us will perish.

Mr. HANSEN. Is it not a matter of how long we survive? Some will survive longer but if the trends now in evidence are not reversed, the justice are we going to be able to achieve.

Mr. McCREARY. Sir, I don't want to be contentious with you in that regard. I am stating this by way of illustrating this point—that is, the point made by the person who testified before me, again, that the environmental imperative is before us but I don't think that human survival—we should not really dwell on that too much. We should rather dwell upon what kind of survival are we going to have, what kind of justice we are going to be able to achieve.

I look at the environment as living space and environmental problems, therefore, as every problem within the living space.

We had a conference on January 28, to mark the passage of 1 year from the spill. Black people there wanted to speak. They weren't on the program. Many people sponsoring the program felt, "Disruption. Isn't this terrible." But these people were just trying to say what we should all be aware of, that, by God, how can you sit and talk about oil on the beaches and tar on your feet when people are living in misery and living in an environment which is made degrading by the same considerations that you are mouthing words about, in the abstract; but here, you can roll up your sleeves and get right down to it, right in Santa Barbara.

So, do I make myself clear?

I think that, let's not think of ourselves as all going to perish. Let's think, "Who's going to go first? Whom are we going to allow to die first?"

Mr. Hansen. Really, the point I was trying to make, also, is that there is a high degree of interdependence, that we have to attack these problems of pollution on a wide and global front. It may be that some will survive longer than others. We depend on each other. As the world shrinks, we are developing the technology to pollute each other's air and water and to destroy the elements on which life has to depend. This is really the point that I attempted to make in my reference.

Mr. McGinnes. I see.

Mr. Hansen. Let me focus on another aspect of the problem.

Coming from a rural State—And I think probably in the course of these hearings, the only one who has talked about it to any extent was Dr. Margaret Mead—even if we achieve the zero population that many have indicated is essential that does not stop the population from moving to these large urban centers.

Now, in my own State of Idaho, we have about 750,000 people. We used to say that apologetically. We don't any more. We are rather proud of that fact. But in many of the counties in the State of Idaho—and this is typical of a great many States in this country—the population is going down; and I think you would find that even if the overall population in the country were to stabilize, that we would be moving out of the areas of the wide open spaces and fresh air into these large urban centers. This suggests to me—and this was the point that Dr. Mead made—that we have to address ourselves to the quality of life in the rural areas. We have to develop the kind of economic opportunities that will make it possible for people to stay in the countryside where there is more room and to earn a living and to live the kind of life that will discourage them from coming into the cities.

There is a great interdependence between the cities and rural areas; so, as we focus on problems of population, we should look not only at overall numbers but where the people are and try to determine the kinds of programs and policies that will make it possible to disperse the people more widely, to live gently on the land, to live in peace with nature, and to avoid this enormous congestion that has been and will continue to be a big factor in the problems of deterioration of the environment.

Mr. McGinnes. Well, I think that is a matter of adult education. There is money to be made in this environmental thing, if industry will realize it. They find themselves in the posture of being called the enemy and they are essentially reacting and coming out with ecopornography, which is the definition of advertising which purports to say that they are involved and they are concerned about the environment when, in fact, they are not.

But what about a simple expedient? Tell me if this is not a simple expedient of telling industry that they just can't come in and set up new plants in this existing urban area; as Ian McHarg said, "Think of a city named Gray Wolf in Colorado." Well, just think of it, where you go put down an industry, bring in enough people to man it. It would be high density housing in a small area, with a lot of open space. The high density housing would be designed in such a way that it would be not demeaning to live in. It would be a self-supporting community, going out in the wilds where no population has been before, whether in Idaho or Washington, the State I came from.

Population distribution probably is unconstitutional. Well, the Constitution is only what the Supreme Court says it is. This is rightly so, I think. I think that we simply have to distribute our population. Now, traditional land-use zoning has tried to do this, in a sense, where you just zone for so many people and unless the local government backs down, as they have done in Santa Barbara on this latest thing, then you can only put so many people in that community.

I think that we have to provide tax incentives and limit it to two and also to distribute our population by legislation. Just say that, "You can't—Sorry but we're full. Go there." And industry will be there because industry's going to be told, too, "You can't come, either. You go there."

Mr. Hansen. So you are going to let us keep our Snake River water up in Idaho, not pipe it down to southern California?

Mr. McGinnis. Obviously—see, I see pollution control racing way ahead of the real things we need. I mean, pollution is really—pollution, to me, isn't really the problem. It's really, you know, the—oh—how do you view life? What do you value?

We can have an antiseptic society, maybe, where we just don't have any real environmental quality.

Mr. Brademas. We do have, at the University of Notre Dame, in the congressional district I represent, something called Lobund, L-o-b-u-n-d. It is one of the few germ-free laboratories in the world and it is, to that extent, free of pollution but not a terribly exciting place to live, I should have thought.

I only mention that because it sounds to me—it seems to me a metaphor for the kind of society against which you are warning us.

Well, this has been a very interesting statement, Mr. McGinnes.

May I ask you just one more question, which is the question that we find everybody asking, across the country, as we discuss this issue: Will the upsurge of interest in the environment be something that simply fizzles away? Now, you, in Santa Barbara, if you lose interest, then no one is likely to be able to maintain interest. Is it your judgment that what happened in your community made a profound enough impact on the thinking of people that the burgeoning concern which your presence represents will continue or fade away?

Mr. McGinnes. Reserve judgment. After the January 28 conference. I mean, it became a social thing to do, for one thing. We—all Santa Barbara society turned out for this environmental program but they didn't give any money and then, we purposely kind of let it rest for a while and Earth Day came around and we purposely again abstained from doing anything ourselves. That is, the CEC did not do anything and nobody made contact with us until about a week before and they all wanted to know, "What are you doing? What are you doing?"

We just said, "Well, we're just going to use what we can and each of us try to live environmentally."

"How do you do that?"

We have a handbook in Santa Barbara that tells you where you recycle, where you go to buy things that are biodegradable, where you can buy milk without its being in a disposable container and things like that and we found that the organizations that had called us to ask, "What are you doing," when they found out that we were only doing that, then they started turning their people on. So it looks like, in Santa Barbara, at least, that we have started something that other people are carrying along.

Nationwide, I just don't know, but I think it's really imperative that we start getting some funds here because it is terribly discouraging, as happened in Santa Barbara, our own Gordon McDonald, appointed to the Council on Environmental Quality, came and spoke to us and told us about all of the things that he was charged with—that is, the Council was charged with. And then we asked him, "Well, how much money has been allocated," and there was no money there and this is very discouraging.

Mr. BRADEMAS. Well, I share your concern. We were distressed when after some splendid speeches by Secretary Finch and Education Commissioner Allen on the importance of environmental education, the Commissioner was put in a position, to be fair to him, where he was constrained to testify in opposition to this bill, a few days ago. So, too, it is unnecessary. So, too, in your own state, you have this pioneering state legislation for conservation education but you do not have any money for it, so I thoroughly share your concern about this matter. We have got to have more than rhetoric.

Mr. McGINNES. Congressman, how will this affect the ultimate chances of this bill if the Commissioner——

Mr. BRADEMAS. We intend to pass this bill, anyway.

Mr. McGINNES. Good.

Mr. BRADEMAS. Whether the administration wants it or not; and, hopefully, they will be thereby enabled to rise above principle and administer what is before them.

Mr. McGinnes, you have been a most helpful witness and we are very grateful to you for having come.

The Chair wants to observe that if his information is correct, we have as remaining witnesses today in Los Angeles, Mr. and Mrs. Leslie Reid, Mr. Cliff Humphrey, and Dr. John Mohr.

Sir, you are Dr. Mohr? Well, if you like, Dr. Mohr, we will hear you right now. You have been very patient, sitting here all morning. And then, we will break briefly for lunch and come back and conclude with our final witnesses.

Won't you come ahead, sir.

STATEMENT OF DR. JOHN MOHR, PROFESSOR OF BIOLOGICAL SCIENCES, UNIVERSITY OF SOUTHERN CALIFORNIA

Dr. MOHR. I have been fascinated to listen. Perhaps, I should speak of my credentials, first. Since 1952, I have been involved in Arctic marine biology. Before that, I did pollution surveys for what was then the State Water Pollution Control Board, in southern Californian harbors. At that time, there was not much money for pushing such things.

I gather the burden here is, Why is education important? And I will try to be brief but make it very clear that I think it is tremendously important because if we are not to be in terrific trouble, we are going to have to pay a very heavy price, a price that is out of step with what we are doing. These days, convenience, comfort, self-indulgence is what we are encouraged to push by most everything we read other than the text of our newspapers and magazines.

Assume what dubious example, perhaps, is set by our Chief Executive who asks for another $100,000 on what looks like an already rather ample entertainment budget.

We need, in fact, both self-denial and self-restraint, and, these, we are not used to.

We used to say, "Waste not, want not," but that is almost un-American for this particular century or half-century. We have to educate people that the highest patriotism is one which provides for our grandchildren and I would like to think even as far as great-grandchildren. We have got to get across, somehow, that the over-50 who sees nothing wrong in asking a boy to give his life for his country must also somehow be brought to see that he should be a patriot beyond his own death, that is, to be willing to pay enough taxes to support the education system, to be willing to give up, again, probably taxes enough that there will be a tomorrow for—if he hasn't any children or grandchildren—those of others. To do this is going to take a most ingenious educational effort and a most vigorous one.

Out neighbor here at UCLA, Lynn White, has pointed out that our very ethical system, the Puritan ethical system, of subduing the earth is partly at fault but there are other parts of our culture, of our tradition, which we have not used which would have gotten us to other places.

In addition to dominion of the earth, there is a psalm that says, "The earth is the Lord's and the fullness thereof."

And there was a concept with the old Hebrews that my colleague, Rabbi Fred Krinsky tells me is still with the Jewish people, of the birthright. One has a responsibility for passing on a birthright not diminished, to those who follow.

We have a need to draw on ideas like these and ideas of Francis of Assisi rather than the ones that the Romans put into capital letters, "If you have a slave you don't want, you have a perfect right to throw him to the beasts."

So it seems to me that your bill is very necessary, that the most that can be pumped into it is hardly likely to be enough but I would like you to consider very seriously not limiting it quite so much. I will buy a first step but I hope you are not thinking just first step. The notion of encouraging cross-disciplinary research—not disciplinary research—of activities of all sorts, is not merely a good one, it is absolutely vital, and I should like to see somewhere in the fine print, some encouragement for it.

The problem that has been brought up here of need for quick information from group to group concerned with this, needs some sort of implementation.

Beyond that, I guess what I would like to say is, do all you can and I hope there will be a proper appropriation bill along with this.

Chairman **Brademas.** Thank you very much, Professor Mohr, and, without objection, a list of courses presently offered at USC relative to ecology will be included, in addition to your own prepared statement.

(Mr. Mohr's prepared statement follows:)

STATEMENT OF JOHN LUTHER MOHR, PROFESSOR OF BIOLOGY, UNIVERSITY OF SOUTHERN CALIFORNIA

It is encouraging that legislative action is proposed to support education in environmental matters. Education is not the only need and, in theory, not the first, but without a large, effective educational program the American people will not understand the consequences of different sets of environmental actions, and so will not have a basis in knowledge for wise decisions.

One may with cause have limited expectations for teaching efforts: We have taught loudly and long that safe driving pays and most of us drive somewhat unsafely. We have implored each other not to deface our landscape, but some of us empty ash trays onto streets or parking lots. But those who have driven in European areas know also that we drive less lethally than some others; we have gone part way in convincing ourselves not to litter. Our education has not all been wasted. We are confronted with a bigger problem: Can we wage a campaign of enlightenment—not so shrill as to deaden the hearing, but so persuasive with hard facts, alternative courses and consequences, and opportunities for a satisfying exercise of love of country and love of countrymen living and yet unborn, that self-restraint and a deep, dynamic civility may become as admired and as expected as patriotism and probity among the Romans of the Republic?

With help from H.R. 14753 and companion bills we may reasonably hope to speed up environmental education efforts and to make them much more effective. Although we need much more "hard data" and especially much more of careful analysis of what will happen if we continue to do *thus* with our minerals and what if we change to *so*; what will be required in recreational areas if we have N people in 1980 and N+X in 2000 or what with M and M+Y people in the same times; what will happen with this radioactive waste production and what with that; we do have a considerable working pool from which educational programs can be drawn at any time. The excellent American Chemical Society brief *Clearing our Environment: The Chemical Basis for Action* and the National Academy of Sciences brief, *Resources and Man* (produced by a committee led by Professor Preston Cloud) summarize well much of what is known indicating the primary sources, and spell out more than enough major causes for concern to make me want to support the purpose of H.R. 14753. Professor Cloud has pointed out, for example, that supplies in sight or retrievable of germanium, helium, mercury, and uranium 235 are all seriously, if not disastrously short. My colleague, Professor Sergio Porto has characterized our use of helium as almost frivolous. At the same time, as the *Wall Street Journal* noted just last week, mercury not retrieved in the production of plastics or chlorine is reaching frightening levels in food fishes of Lake Michigan: Of a somewhat similar paradox, last week the *Christian Science Monitor* pointed out that there is a shortage of high quality gas; on the same day newspaper advertisements occurred urging purchase of gas-air cooling systems and billboards showing that "only three chefs in a hundred" do not cook with gas—thus urging the use of more gas.

It is probably not necessary to multiply instances to convince subcommittee members that people generally meet large quantities of conflicting and confusing "evidence" and that the needs of environmental quality are not always well served. I concur most heartily with the statement "that adequate resources to educate citizens in these areas do not now exist". I support energetically the view that the programs are needed at every level and that they need to be better in content and richer in method than they are now. I am particularly pleased that there is provision for support for community education *"especially for adults"* because adults are the now-deciders and also because "continuing education" is one of the most important aspects of a really civilized nation—and there is not very much encouragement for it these days.

There is one sort of activity that is not now in H.R. 14753 that I should like to see explicitly encouraged, namely programs with major interaction of specialists and generalists from various of the widely different disciplines concerned with environmental quality. I urge this because in the past months at U.S.C. I have seen a series of interdisciplinary discussions bring out not just the ways in which our religions and ethical assumptions have led to some present difficulties, but also how emphasis on certain other values very much a part of our culture's value system could have led to somewhat less destruction of the environment. The interaction of philosophers, theologians, social, political and natural scientists, business specialists and engineers has pitted one set of realities against another, awareness has grown, and so has conviction that decency and practicality can coexist. We have not so far engaged the medics or some other university groups, but we shall, as each expansion to a new discipline so far has resulted in possibilities for greater effectiveness in an environmental education program (or programs) which is one major reason for our working together. I am sure that encouragement of such interdisciplinary activity is in the spirit of the act and that inclusion is compatible with other portions.

In sum I regard H.R. 14753 as needed and intelligently conceived legislation that might usefully be expanded in some respects.

COURSES PRESENTLY OFFERED AT USC OR PROPOSED FOR 1971 RELATING TO ECOLOGY

529. Ecology, life history, behavior of marine spp. Definition of problems and methods of control of fouling and pollution.
505L. Tropical Biology: An Ecological Approach. The tropical environment and biota: ecologic relations, communities and evolution in the tropics. (OTS) at San José, Costa Rica, with U.C.R. and a group of U.S. universities.
572L. Marine Ecology: Structure, diversity, and energetics of marine communities; behavior, population dynamics and biogeography of component species; associated oceanography and parameters geology. SCMBL—Catalina Island Laboratory.
508L. Invertebrate Marine Zoology: Functional morphology, life histories and systematics of marine invertebrates of all major and most minor taxa; emphasis on the living animal and its habitat. (SCMBL) Catalina Island.
561L. Physiological Ecology of Marine Organisms: Energetics and behavior of organisms in relation to their environment, feeding characteristics, metabolic requirements, nutrient demands, movement patterns and reproduction will be studied. (SCMBL) Catalina Island (New Course for Feb. 1970).
567L. Marine Plankton Ecology: Composition, population dynamics, productivity, distribution, migration and energy cycles in phyto- and zooplankton communities. (SCMBL)—Catalina Island.
521L. Advanced Population Biology: Population dynamics and interactions in tropical communities. (OTS)—The Costa Rican group.
522L. Ecologic dynamics of shallow-water tropical communities. (OTS) the Costa Rican group.
385. Colloquium: Biology—Environment and Pollution (undergraduate).
532. Seminar in Ecology (Interface, Molecules Meet the Biosphere).

Mr. **BRADEMAS.** I would observe, and I am sure you are aware of the essay of Rene Dubos, "The Theology of the Earth," commenting on Lynn White's saying St. Benedict would be a better patron saint than St. Francis of ecology in that St. Francis was simply passive with respect to the environment while St. Benedict and the Benedictine monks actively intervened to protect the environment. And I take it you would not quarrel with that theological amendment.

Dr. **Mohr**. Not a bit. I would say, let's get arm-in-arm with all the saints who are willing to go our way.

Mr. **Brademas**. In your prepared statement, I was also impressed by your strong support for adult education, which is the same point of view that Mr. McGinnes, before you, strongly endorsed.

I would finally observe that we have all, I think, been impressed by the theme that so many witnesses especially from the higher education community have echoed on the importance of interdisciplinary approach here especially at the higher education level.

Dr. **Mohr**. Might I say just one word on this. One of my neighbors from UCLA has pointed out concerning the patterns of universities, it has to be conceded that a private university has a tremendously greater flexibility and our engineers, for example, have set up a new curriculum in environmental engineering. They have had participation from various other people. And on our campus just yesterday, I met with one working group in which religion, philosophy, two engineering groups and biology were working on systems of values. We will feed this to other working groups that are trying to tie together economic, political, legal models which will interact with people in the technologies and which will ultimately and, we hope, not too far away, result in a strong educational program.

Mr. **Brademas**. Well, that is fine.

Now, the one you neglected to point out was somebody from the school of education.

Dr. **Mohr**. You may have heard about our local strike. There is, so far as I know, no one on our faculty from the school of education marching with the teachers. There is no one who has made a strong statement that the school board is right and no one has come up with a reasoned statement why a school of education should be neutral. They have striven for a grayness that troubles me very much. I do not know what the answer is, to schools of education.

Mr. **Brademas**. Maybe they are not necessary.

Dr. **Mohr**. But I do not know anyone that has found it.

Mr. **Brademas**. Maybe they are not necessary.

Dr. **Mohr**. I think they are necessary. I think they should be providing us with effective techniques but they are not providing us with backbone.

Mr. **Brademas**. Thank you, Dr. Mohr.

Mr. Reid.

Mr. **Reid**. Dr. Mohr, I was very struck by your opening remarks, your obvious statement that we need self-denial and self-restraint, that we must provide for our grandchildren and hand down the environment without being diminished, is imperative.

Let me ask you really two questions somewhat in one. You talked about the frivolousness or quoted the frivolousness of Prof. Sergio Porto—which Prof. Sergio Porto has mentioned in connection with helium. You have talked about mercury that is not being retrieved. Let me ask you not about that but about one of your areas of specialty in relation to the problem.

I think all of us are struck with the very great urgency we are faced with here. There has been testimony, this morning, that the oceans might be polluted almost beyond retreat by 1979. You are a specialist, marine biologist in the Arctic. What is your guess, given our present rates of pollution, as to the likely life of the oceans, at this point?

And then, what do you think we have got to do measured against that, to see that the cycle is immediately reversed so that we save the oceans?

Dr. MOHR. In two or three sentences?

Mr. REID. As many as you would like.

Dr. MOHR. I am not one of those who sees Armageddon next week or in 10 years. I do see that as we are talking, the sea is becoming less good. There are certain areas, for example, yesterday, I attended the opening of a new marine science institute in which you do the sort of education that we have been talking about. It was on the sight of a marina that had been dozed out of a beautiful preexisting environment.

(Comments off the record.)

Mr. REID. What I am trying to suggest, with as much precision as you, with your scholarly competence could bring to it, is what, really, is the magnitude of the problem in an area with which you are familiar. What is the urgency with which we must address ourselves to it? It is quite plain to me that the Federal Government is putting in pennies where thousands of dollars are required and all I am trying to suggest, because you know a great deal about this, how do we thoughtfully, carefully dramatize what we must dramatize without talking about Armageddon. I think we have got to put this in clear perspective and I think we cannot just say, "We will creep up on this for the next 1,000 years," because I do not think that is going to be good enough.

Dr. MOHR. It is very flattering to be told I know these things. The only comfort to the state of my ignorance is that I am quite sure that it is reflected most other places.

Mr. McGinnes has said that we do not need to worry about Santa Barbara but there are a lot of things about that I am worried about very much and some of them concern the integrity of my own institution. You may recall that a matter almost of hours after the spill, certain Government agencies tried to get expert help as to what had happened, really. Within a couple of days, it was published in our local counterpart of the *New York Times* that the heads of the petroleum engineering departments of three institutions, Cal, Stanford and USC, had, for one reason or another, in essence said, "We are too beholden to the industry to come to your aid." We have since brought this up as a Senate matter at USC. I do not know what has been done other places. We have not come to any conclusions. I have found that another department has been very disturbed at my stirrings in the Senate because it happens to be looking for a new building and the best possibility for support is the petroleum industry. This is bad enough. But the agency in Government—I believe it is something like the Division of Mines and Petroleum, in Interior—is also a pocket.

Mr. REID. No question of that.

Dr. MOHR. Where are we to go for knowledge?

Mr. REID. I think that is a very central point. I think integrity of government is very important.

Dr. MOHR. Integrity of universities is important.

Mr. REID. The Department of Agriculture is not doing what it should or the Federal Power Commission. The list is very long. I am sure you have got difficulty with the board of regents here, and the question of the integrity of some universities. They will not speak out candidly.

Dr. **Mohr.** What I have to answer with respect to the question you asked before is that I do not really know and I do not believe anybody else knows.

Mr. **Reid.** Can I make one final attempt at getting not what you know but what you sense or what you are concerned about or what is the rate you are inclined to think we are polluting the oceans or, put it another way: How do we get ahead of this problem? The rate starts to strike me as being worrying. Am I wrong on this?

Dr. **Mohr.** No, you are not wrong and these, especially rates of change, are the things that are the key issue in all these pollution problems. We have recently opened a marine station on Catalina Island. The reason this is necessary now is not that there is a tremendous need for the programs there but that one has to stake off a place at which he can hope for clean water, as clean water becomes less and less a possibility along the coast. But the Santa Barbara spill apparently reached us, too. We were only sort of ahead of the game. I think that everywhere, certainly with the hard pesticides, the stuff has reached out. We do not know how fast it may be concentrated.

With the mercury in the streams, we now know that Lake Michigan is in bad shape. We do not know yet how much it is creeping up in the oceans. We have not had the resources to do the monitoring to have any notion about rates. And you will find it you could dig back in the applications for funding for research proposals, that several departments, including Interior and Health, Mr. Finch and NSF, have been very reluctant to support those able and willing to do these unimaginative fact-digging things. There has not been money in anything like what is needed to do them. That, of course, is not what your bill is trying to do and it cannot do it but, certainly, the sense of urgency is not phoney, no matter what some people may say. There may be some people who are too shrill about a certain year. I do not think it is possible to be too shrill about the long run.

Mr. **Reid.** Thank you, very much.

Mr. **Brademas.** Mr. Hansen.

Mr. **Hansen.** Thank you, Mr. Chairman.

Let me focus on your own university and specifically on the biological science where you have been most active and ask what has been done or is being done to restructure the courses to take into account the growing concern over the environment. To what extent have your efforts been limited by the lack of the kind of help that may come from this bill?

Dr. **Mohr.** If I may answer the second one first so I do not forget it, hard facts are the educational resource of which there is least available. I mention in my deposition two good sources but a very large part of the Preston Cloud report is directed to the fact that we need very very much more in the way of solid knowledge. I think every teacher who is concerned about this problem would be most grateful for any effective source of new materials. For one thing, the listeners are getting tired of hearing the same instances. They may be valid but they get to make calluses on the eardrums.

Now, as to what is happening on our campus, we are working in biology on a number of different levels. We have our course for nonbiologists and from now on at least, for a good while, this will be directed at biology for the people, and mainly what one should know about environment. We are introducing in the fall what we call the biological semester, which will be taking people again not from biology but from other parts of the campus and immersing them for one whole semester in nothing but biology. And here, again, the state of the environment and what one needs to know about it is a very major part in the program. A microbial physiology course is mainly ecological in content. We are looking at our present environmental courses for majors. We know they are not good enough. We sometimes feel we are trying to do too many things at once. We do not know how much better they will be next year, but we are confident they will be somewhat better, next year. We are interacting with the engineers on a 5-year program to produce environmental engineers and we are interacting with them in producing an all-campus seminar in which biology and engineering interact.

Finally, we have this all-campus effort that we have talked about to provide an approach to the environment from our existing cultural values and how we got here as basis for an educational program which should have content in fact, in ethics, and in the economic patterns that make for reality.

I think that is a fair quickie of what we are up to.

Mr. HANSEN. Thank you very much.

I want to say again how much we appreciate what has been one of the most useful contributions to these hearings. We are grateful to you that you had the patience to wait until we could hear from you.

Dr. MOHR. We appreciate any committee which will stay beyond noon on a Saturday.

Mr. BRADEMAS. Thank you very much, indeed, Dr. Mohr. It has been most helpful to us.

The Chair wants to announce that we shall now adjourn and we have only two or three more witnesses scheduled for this afternoon and we will come back at 2 o'clock or thereabouts.

(Whereupon, after the luncheon recess, the following proceedings ensued at 2:10 p.m.)

Mr. BRADEMAS. The subcommittee will come to order.

Our final two witnesses today are Mrs. Sally M. Reid, author and co-ordinator of community education program in Los Angeles City schools, and Mr. Leslie Reid, biology teacher at the Polytechnic High School.

Is that in Los Angeles?

Mr. REID. She is the biology teacher.

Mr. BRADEMAS. Oh, I see.

Mr. Leslie Reid is the director of the speakers bureau for the Sierra Club of Los Angeles.

Is the Polytechnic High School in Los Angeles?

Mrs. REID. Yes.

Mr. BRADEMAS. Won't you both come ahead, and we look forward to hearing from you.

STATEMENTS OF LESLIE REID, DIRECTOR, SPEAKERS BUREAU, SIERRA CLUB, LOS ANGELES; AND MRS. LESLIE REID, BIOLOGY TEACHER, POLYTECHNIC HIGH SCHOOL. ORGANIZER OF TEACHERS ENVIRONMENTAL CONFERENCE COURSE

Mrs. REID. Mr. Brademas, Committee, I am really primarily a biology teacher. In terms of my work in the environment in the course of the last year or two, I have been working more and more from an ecological standpoint in my classes. In the last year, in the work that my husband and I do in the Sierra Club, our attention has been centered on the crisis in the environment, and this is reflected in my work in my classes.

I have felt for quite some time that somebody should be doing something about teacher education. I kept waiting for something to happen and nothing did, so I went to my principal one day and said, "There really ought to be a course in teacher in-service training for teachers in the Los Angeles City schools in the environment," and he agreed, and he asked, "Well, do you want to do it here at Polytechnic High School?"

And I said, "No. I think it is something that should be done on a broader level than that. I think it ought to be possible to pull a program together from various people my husband and I are in contact with and that it really shouldn't be too difficult to do, if we could just get approval".

So he began to make phone calls, and after a number of calls and volumes of red tape, we came up with the—or, actually, together with the principal of the Van Nuys adult school, we came up with a program that is now in the process of being presented. In other words, we have completed four of six lectures in the series.

There are a number of things that I think highlight both the problems in getting the program established and the problems that exist now that the program is established which might be relevant to some of the teacher training and education that you are talking about in your Environmental Quality Education Act that you are working on now.

There is a real problem in reaching people with what you want to do. In other words, if you get a group of specialists together and you present lectures, how do you get somebody to come and listen to them?

Our primary problem was to offer a point credit to teachers and that means a percentage of salary toward a salary increase; a salary point credit, it is called. And it took a lot of doing to get that through the Los Angeles City schools, right up to the Board of Education. In a district this size, you do not really have much personal contact with the board of education. They did feel that it was worth trying to do something about. But the in-service division has been discontinued in the Los Angeles City schools due to financial problems. They had to present the course through the adult school; and so, by going through the adult school, the idea of having both the general public and teachers at the same time was approved.

Publicity was handled in what I would call a haphazard fashion. It was not very effective. But despite the teacher strike in Los Angeles at the present time, and despite the fact that the publicity was really almost nullified by the imminence of the strike, we still managed to get an audience consisting of several hundred people every week of whom about half are teachers. There is quite a good deal of positive response to this program.

I would say that the audience indicates a feeling that they would like to participate more than they are able to, the way the program is set up. I would like to suggest that this kind of program is a good thing to do and something that really reaches a lot of people and can potentially reach hundreds of people, if it could be instituted on a citywide basis at various locations where people did not have to drive too far, or else in small communities. But some provision should be made for more interaction of audience participants with one another, with leaders, with the speakers and with issues, so that they might become a working group rather than just a listening group.

But certainly as far as its being a type of approach to teachers as in-service education, I would say that it has been successful, and probably the largest deterrent to continuing it will be lack of funds. From the standpoint of the Government, I would think that you would want to see to it that funds be made available. It is getting almost impossible to have any kind of money available for this kind of thing. Money is needed for honorariums to speakers, to pay the co-ordinator and get publicity and so forth. For all of this, there is no funding.

Mr. **Brademas**. Thank you.

Mr. Reid.

Mr. **Reid**. I have looked at your bill and, along with other members of the club, both on a national level and a local level, I am basically in favor of the entire idea of the act.

I want to direct your attention specifically to that portion of the act in which the authors talk about community education and I wanted to tell you a little about my experiences this spring.

As chairman of the Speakers' Bureau club, I have been, as I say in my statement, literally inundated with requests for speakers. Now, this despite the fact that as you well know, the entire media has concerned itself with environmental problems in depth and in very attractive ways, in very understanding ways, but still in all, all these organizations want speakers. They want someone to come down to them that they can talk to and they can talk back to and also, they want to know what to do about it. It is not just enough—when they read a newspaper or they listen to a radio or watch television, they are sort of passive, sitting there in the living room. When they come to the Sierra Club, they are asking someone to come to them whom they trust.

On the basis of their past record, as someone who has no selfish motives in the problems of the environment, as far as I know—and I have some knowledge of people in various Government agencies—the various Government agencies involved in the environment have not been inundated with any unusual requests for speakers on the environment primarily because, I believe, of their past record; they are suspect.

They do not call the County Agriculture Commission who theoretically would be the agency whom they would expect to protect them on the pesticide problem very well when you know that they have been okaying the use of DDT and pesticides in a manner which is almost irresponsible, so they call people whom they trust: Audubon Society and the Sierra Club and other organizations who have had a good record. These organizations are very wide in interest and in composition. As you can see, I have noted some: Kiwanis, Rotary, the Corps of Engineers, local organizations, labor unions, political clubs, PTA's, student groups, all of these kinds of people want to hear what they can do and how they can do something about it and they want factual information, they want to know "what is" with respect to the environment in the hope that the Government will be able to help them organize.

We think that people in Congress, like yourselves, who are interested in improving our condition, we think that you should encourage this type of program. I don't think, contrary to the larger programs that are necessary in the schools and in the colleges, I don't think great sums of money are involved. I don't think there should be any great community-coordinated bureaucracy set up. I don't think we need anything like that. I think we need something on a relatively limited basis, using most of the volunteer organizations, and the sums involved should be primarily trying to compensate for out-of-pocket expenses and that's all. That's all that's really necessary, I think.

I think that these organizations are willing to move and I think that those organizations who are willing to volunteer their services and to put people into action to let them become aware of these problems and then to let them act as watchdogs, if you want to use the word, on their agencies, on their representatives, State and Federal, so that they can act knowledgeably—this is all we're trying to do, is to act—have them obtain the information not only as to what is wrong but what they can do, get them personally involved, get them to personally participate in it and if the committee can write the kind of legislation that will encourage this, I think that it's one of the big answers to our problems of having the American people know what they really want.

I thank you.

Mr. BRADEMAS. Thank you very much.

I noted, Mrs. Reid, you commented on the need to provide salary point credit as incentive for attending. That is a word of art, I take it. That means that teachers ought to be paid to go to these courses or——

Mrs. REID. It is kind of a way of paying teachers. They get a salary raise with 14 points, in Los Angeles, they go to another salary column or step of—more money.

Mr. BRADEMAS. What does that mean, in plain English?

Mrs. REID. I thought I just put it in plain English.

Mr. BRADEMAS. No, you did not. How much money?

Mrs. REID. How much more money?

Mr. BRADEMAS. How much more money does a teacher get if she goes to your course? That is what I mean.

Mrs. REID. Well, she doesn't get any more money at once but with every 14 units of university credit or point credit, which is the Los Angeles city school equivalent of a university unit—with every 14 of those, she gets whatever the current salary schedule calls for, like in the neighborhood of $300 a year.

Mr. REID. More?

Mrs. REID. But that is every year—more—so a point would be worth about $20 a year——

Mr. **Brademas**. I was just trying to get——

Mrs. **Reid** (continuing). A year, from then on; but you wouldn't get it at that particular moment.

Mr. **Brademas**. And this series on which you have given us this leaflet——

Mrs. **Reid**. Yes.

Mr. **Brademas**. Is this the series which was—of lectures, which were attended by both adults and schoolteachers in the Los Angeles city schools?

Mrs. **Reid**. Yes.

Mr. **Brademas**. For the purposes of giving those who attended the course some overall picture of what we mean when we talk about environment problems and the purpose in attending these courses was not that teachers should go back into the schools and offer courses in environmental studies but rather that they themselves should be better informed on the subject.

Is that right?

Mrs. **Reid**. Those of us who teach feel, I think, pretty generally—think that if we are given the information, we can turn it over to the kids. That is part of the art of teaching. My original idea was to give teachers an idea of the importance of the problem, the scientific background to understand it and a feeling of their own importance in doing something about it. Whether they do something about it through their own actions or through the children that they reach every day is left up to the individual.

Mr. **Brademas**. Mr. and Mrs. Reid, I had better let Mr. Reid put a question to you because he has to leave.

Mr. **Reid**. First, I want to thank you both for the points you have made which I think are relevant and very useful. I like your course in adult education. I was interested in the concept of combining adult school with teacher education and I like the idea of community watchdog.

There is one question that I would like to ask you both. What we have heard in the State of California is that while there is an amendment to the education statutes or guidelines on the need to teach about conservation and the environment, in fact, only $176,000 was appropriated, so it is clear there is very little monetary support.

My question is, what, actually, is being done in the State? What kinds of materials are being used in regular classes on the environment, and is the material relevant to the urgency, the magnitude, the overall inter-relationship of the ecology, the planetary problem, or is the school system in California essentially teaching what might be called the old varieties of things that do not highlight the crisis: what the individual can do, in terms of what we have got to do in institutional change; or, you name it. What is the child exposed to in the California school system, I guess, is my question at this point.

Mrs. **Reid**. I will have to answer from the high school level because that is where I teach. My experience through my own children in the lower grades is that they were exposed to nothing along this line. Conservation, when they were in school, consisted primarily of thrift. It was, "Put a dollar in the bank and write on both sides of the paper."

Mr. **Reid**. What about the high school level, now?

Mrs. **Reid**. But in high school the average student takes a year of biology in the 10th grade, called the biological science curriculum study.

Mr. **Reid**. I am speaking about average.

Is there anything he gets on environment, regularly?

Mrs. **Reid**. One form of that study is called the green version. You may have heard of that. It's ecologically centered and there is a great deal of emphasis on populations and——

Mr. **Reid**. Population and food?

Mrs. **Reid**. Yes. There is, however, a noticeable reluctance on the part of the authors to make the important connection between the bird populations on an island that they talk about and the yeast populations in test tubes with human populations on the planet. And it's this punch that——

Mr. **Reid**. Is lacking?

Mrs. **Reid**. The teacher must bring to the classroom. And this is a definite lack, I think, in the textbooks and in the classrooms of most teachers because I don't think they have the confidence or the knowledge to do this.

Mr. **Reid**. Yes.

Mr. Reid, do you have anything?

Mr. **Reid**. I can only add that if there had been any kind of a conservation education in California, the Sierra Club wouldn't have to do the kind of job that it's required to do. In other words, we are doing something which we really don't think that we're set up to do but we are doing it because we are filling a vacuum.

Mr. **Reid**. You have helped in national leadership and we are all very grateful to the Sierra Club.

Thank you, very much.

Mr. **Brademas**. Mr. Bell.

Mr. **Bell**. Mr. and Mrs. Reid, it is a pleasure to welcome you before the group.

Did I understand that you felt that you were not particularly concerned about the teachers' program, a teachers' training program; that you have volunteers to do this?

Mrs. **Reid**. We are married, but I am a teacher and I have put this program together. Les is a toolmaker and he gives all of his time outside of his work, all of his extra time, to the Sierra Club and the work he does is voluntary. My actual job and the voluntary work I do are each related to the environment, to ecology, and it really is for Les, too, except for his 8 or 10 hours a day. Some of these questions that you direct to us together, we have to answer separately.

Mr. **Bell**. I will direct it to you, then.

Did I understand that your plan or program, philosophy is that you favor a teacher training program or do you favor an entirely volunteer situation?

Mrs. **Reid**. Oh, no. I think that this program has been very successful and should be expanded. All teachers should be urged to attend a program of this kind.

Mr. **Bell**. You would be in favor of a strong, well placed, well analyzed regular teachers' training program?

Mrs. **Reid**. Inservice, yes, as a dual program between the community and teachers that has the extra benefits of the interaction between the two groups of people, parents, really, and teachers. Audience interaction is really a very good thing and I think should be stressed. In other words, I am glad it worked out this way. It was not my original intent to do the program this way but it seems to be a very good thing. This is a situation where we provide a program and people come to it. Now, in the programs that Les is involved in, there are groups of people who ask the Sierra Club to come to them. It's the other way around. It's two different kinds of approaches to community education, I would say, and I don't think that one rules out the other. I think they are both good.

Mr. **Brademas.** Mr. Hansen.

Mr. **Hansen.** Thank you, Mr. Chairman.

Let me ask, first, Mrs. Reid what specific ways to—do you think that the passage and implementation of this bill would help the kind of a program that you have developed here?

Mrs. **Reid.** I would say through funding and through emphasizing the importance of doing it, backing up the fact that this kind of program should be taking place in the assorted districts, and possibly getting the district to back it with publicity.

Mr. **Hansen.** Do you think the passage would provide the kind of declaration of national policy that would be helpful?

Mrs. **Reid.** I think that would be helpful and, specifically, I think that there has to be some funding in this kind of situation. I don't know how the specifics of that would be handled but I'm sure that a district could work out a presentation for funds.

Mr. **Hansen.** Now, Professor Mohr made reference to the value of the hard facts that might be developed through programs sponsored under this bill. Would you see some value in the factual materials, the teaching materials that could be incorporated into this kind of course, flowing from this bill?

Mrs. **Reid.** I would certainly think that would be a worthwhile part of the outcome of the bill, to get curricular material. I assume that you have that in mind, curriculum development. Is that what you had in mind?

Mr. **Hansen.** Yes. I am asking you if there is something that you could use in the development of this course of training that might be the result of this legislation.

Mrs. **Reid.** Yes. I would say that more people would receive the training that they need in order to continue the training for more teachers, students, and the public. In other words, get the ball rolling in terms of spreading the educational facts.

I would just want to say one thing: that I don't think that all of the responsibility for spreading the knowledge should go to the universities. I think that there is a great deal to be learned from this kind of program which is not really founded in the university; that the universities have their programs and people go to them to take courses and so forth but this is a little bit different. It has a little easier appeal and doesn't stop some people, the way a university course would.

Mr. **Hansen.** The reason for these questions is to try to highlight some of the ways in which a Federal program such as this could be uniquely useful. It would seem to me that the kind of thing that you are doing here ought to be done pretty well generally as a part of any teacher training program, inservice training program, across the country. The Federal contribution, I think, can best be the development of the innovative kinds of efforts that would be a supplement to and a help to the kind of program carried on here. If it is purely a matter of Federal funds, then I think you can make a pretty good argument that those funds coming from the same taxpayers really ought to come as part of the regular school program. It is really a matter of priorities, of deciding that this is sufficiently important that we ought to do this with limited funds.

Mrs. **Reid**. I understand, now, what you are saying, but I don't think I agree with it. We look to the Federal Government for leadership in pushing this kind of program through. In other words, I don't think we can leave it to each individual school and each individual district, to come to this kind of thing on their own. We look to the Government, to the Federal Government, for the impetus to get this kind of thing started and I think your Environmental Quality Education Act offers that idea, that this does have priority in the country, that our Federal Government is concerned with something more than Cambodia and the moon, that they are also concerned about the environment and that they are going to stand behind doing something about it, just as it filtered down to us so that we were teaching space science in 1958 after the Russian Sputnik in 1957. I think that the schools need the Federal Government's leadership and I think that you should provide it.

Mr. **Hansen**. Provide the bulk of the funds for this kind of program, would you say?

Mrs. **Reid**. Not just the funds but the leadership and the impetus for the whole program, lending your support and your knowledge and your leadership, through different agencies.

Mr. **Hansen**. Does it not really still depend, in the final analysis, on people being sufficiently concerned and that concern being reflected through their school boards, through their State legislatures, through their State and local public officials, to decide that this kind of program should be assigned a very high priority, should be assigned funds from the regular sources, in order to carry it on?

Mrs. **Reid**. Well, yes, but I don't know who starts what. Yes, the public should become concerned enough to insist that this be done and, yes, it has to be done in order to make the public concerned enough. In other words, you are working in a circular situation where the concern of the public will bring this about and bringing this about will increase the concern of the public.

Mr. **Reid**. I think, if I may interject here——

Mr. **Hansen**. Yes.

Mr. **Reid**. I think that one of the things that the Federal Government can do to help this is to assign in its own division of Federal funds, the priorities necessary to do something about our environmental problem. In other words, you are not setting a good example in Congress when you talk about the environment and the environmental problems and assign such a miniscule amount of Federal funds to it and, for example, support SST which almost every known authority thinks is a ridiculous boondoggle—at least, I do—and I think there is a tremendous support for this opinion and to support that and say that, "We are going to go ahead with the SST program," and at the same time assign much smaller amounts to environmental education is the kind of leadership that permits local people to say, "Well, we're paying enough taxes for what we've got now and if we've got to pay more taxes to get environment education, to heck with it." So I think that in this sense, the Federal Government has a good opportunity to provide leadership in its own division of the pie, so to speak, and when it begins to devote the majority of its efforts along these lines rather than in the other lines, I think that they will set such an example to the public that it in itself will be part of the education of people to change their attitudes toward our environment.

Mr. Hansen. I would certainly agree that leadership is the one area where the Federal Government can serve an essential purpose. Our attempt here is to try to identify the kinds of thing with the limited resources that will be available for this or any other worthwhile program, can best be used in order to point the direction in order to create the opportunities within which there can be creative and innovative progress in the development, as Professor Mohr said, of the hard facts, in the development of pilot programs, in creating the conditions within which the concerns that should be stimulated then will produce the comprehensive program such as this.

Mr. Reid. Well, those of you who are in Congress who recognize this importance should appeal to the people, should appeal and point out what you are doing, for example, with these appropriations for the Corps of Engineers as opposed to what you are doing in this field, for example, and I think that you can perform a tremendous service to the American citizenry as a whole by saying whatever has happened has happened but now, we are faced with a crisis and we simply can't afford both and we simply—that is the part of the leadership, financially, that I think you need to provide. Possibly, if you take the lead in that, then we might not have so much of a problem in passing our school bonds and our overrides and so forth and so on.

Mr. Hansen. Let me conclude by thanking you for your leadership in the area. It has been most helpful.

Mr. Brademas. I might observe, Mrs. Reid, that apparently the Los Angeles city school system did not put high enough priority on the inservice training programs that you were describing, to continue financially supporting them. I think that is most unfortunate. The same point could be made with respect to the failure of the State government of California to fund your conservation education program, to which failure we made reference earlier. We, in Congress, are guilty of the same shortcoming and I guess that is what politics is all about: fighting to get programs funded. I happen to be one of those who thoroughly agrees with you that the SST is absurd and ridiculous, an anomalous way to waste taxpayers' dollars to get to Paris an hour earlier. We do not even have enough airports in this country now to be able to land on time the airplanes we already have.

I was also impressed by the statement dated May 2, 1970, by the Los Angeles chapter of the Sierra Club in support of legislation leading to educational programs to preserve our environment and I would ask your unanimous consent that the statement be inserted in the record. It seems to me that, taken as a whole, it is an excellent statement of the overall purpose of the legislation that we have been here been here considering.

(The statement referred to follows:)

A STATEMENT BY THE ANGELES CHAPTER OF THE SIERRA CLUB IN SUPPORT OF LEGISLATION LEADING TO EDUCATIONAL PROGRAMS TO PRESERVE OUR ENVIRONMENT

The quality of our environment is of great concern to school children and adults alike and increasing numbers are becoming aware of the need for environmental education in the educational programs of our public schools and our communities. Environmental education has been defined by the Conservation Education Advisory Committee to the California State Department of Education as developing in each student "a healthy attitude of personal responsibility toward his environment and its resources, and providing him with concepts, the knowledge and skills needed to contribute validity to the decisionmaking process on issues involving the environment and its resources." Development of such an attitude is prerequisite to solving (in the long-run) those ecological problems which threaten the very survival of the human race.

A well-trained teacher is the key to a successful environmental education program. To be well-trained a teacher must be instructed in the philosophical, scientific, technological, and social aspects of environmental problems. In addition a teacher must be given instruction in the specifics of teaching environmental matters at his particular grade level and subject area. Such instruction is not generally provided in undergraduate programs at present and most of the teachers now teaching lack these skills, knowledge, and attitudes.

If the environmental education program is to be successful, well-trained teachers must have good classroom teaching materials such as high quality textbooks, supplementary books, film strips, picture sets and motion pictures. Such materials are not presently available in adequate supply in most schools. Additionally, local school districts and county offices need materials and guides to assist them in planning programs suited to local needs. The production of such materials is often beyond the resources of local school districts and county offices. Finally, development of environmental education curricula and materials can best be evaluated by environmental specialists with the appropriate technical background.

Private conservation agencies and governmental resource agencies can make many valuable contributions to the environmental education effort and are, for the most part, anxious and willing to be a part of this important work. Printed materials, films, speakers, technical information, field trips, and other services are available from these sources. These agencies are currently under extreme pressure to provide these services, pressure which is severely straining their limited resources.

In consideration of the overall requirements for environmental education, the Executive Committee of the Angeles Chapter of the Sierra Club urges the federal and state governments to develop a far-reaching and adequately funded environmental education program, which includes or provides for the following aspects:

(1) Development and institution of both preservice and inservice training programs for teachers in the philosophy, principles, and content of environmental education, It must be stressed that such training should include explicit emphasis on the following necessary preconditions of achieving ecological balance: the need for a new sense of restraint in our consumption of natural resources and a responsible sense of limitation regarding population and economic growth. These specific goals should be written into the enabling legislation.

(2) Development of environmental education courses for elementary, secondary, college, and adult education programs.

(3) Development of an environmental education outline listing essential concepts, and showing possible curricular applications in many subject areas and grade levels. Environmental education should be carried on in many subject areas on many occasions.

(4) Support of the development of improved textbooks in the environmental area and of the development of requirements for strong emphasis on environmental matters where appropriate in a wide variety of textbooks in many subject areas; encouragement of the production of worthwhile environmental education materials in many subject areas as well.

(5) Close cooperation with conservation organizations and other local resource agencies and provisions of technical assistance for their environmental education programs, including development of materials, provision of speakers, etc.

> (6) Initiation of pilot demonstration projects to test new curricula and provisions for the evaluation of the effect of these projects and the dissemination of significant results and curriculum materials for widespread use.
> (7) Enabling legislation should explicitly provide for administration by an Advisory Committee principally composed of environmental specialists and representatives of the public at large who have demonstrated interest in preservation of the environment. Membership of the Committee should also include some representation by specialists in education.

Mr. BRADEMAS. The Chair wants to reiterate his appreciation to our colleague, Congressman Bell, for having made arrangements for us to conduct these hearings in the district that he so ably represents and, indeed, to express appreciation to all of the witnesses who have appeared before our subcommittee, in San Francisco yesterday and here today in Los Angeles.

This is our last day of hearings on the Environmental Quality Education Act and the Chair hopes very much that with the support of members of this subcommittee and other Members of the House of Representatives and the Senate, we shall succeed in writing into law a bill which I hope will not only be valuable in stimulating education about the environment but will also symbolize what I think all of us hope is a deepened sense of the profound importance of the environment to the future of our country and of mankind.

We are adjourned.

(Whereupon, at 2:49 p.m., the subcommittee adjourned.)

APPENDIX

TESTIMONY OF HON. DAVID R. OBEY, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF WISCONSIN

Mr. CHAIRMAN. I would like to indicate my strong support for HR 15822 and identical legislation—of which I am a co-author—which authorizes the U.S. Commissioner of Education to establish educational programs encouraging the understanding of policies and activities which enhance environmental quality.

This legislation, commonly known as the Environmental Quality Education Act, would provide federal funds for teaching about natural resources, conservation, pollution control, and the need to maintain a balanced ecology. It would provide grants to colleges and universities for developing teaching materials, for teacher training, for pilot projects and for the support of environmental education both in schools and community programs.

Certainly cities clouded by air pollution, lakes polluted and aging, wildlife threatened by pesticides and shorelines damaged by oil spills or haphazard development all point to the fact that we are in a race to save our environment, and it is in a sense a race between education and catastrophe.

As the noted ecologist Barry Commoner has pointed out, "we are unwitting victims of environmental pollution, for most of the technological affronts to the environment were made, not out of greed, but ignorance."

The fact remains that there is a serious gap in our knowledge of the environment and certainly in our ability to inform those in our schools about the beautiful but fragile balance of nature which must be preserved and protected.

If we do not recognize that man is rapidly altering his environment on a massive scale, we may be facing the catastrophe which the cave man was able to avert—an ability to live on the planet we now occupy.

Man has not always been able to overcome his own abuse of his environment. A recent article in the *New York Times* pointed out, for example, that 1300 years ago one of the great civilizations atop Monte Alban in Southern Mexico went into a catastrophic decline because it had inadvertently destroyed its own environment. Although the evidence is meager, it is believed that through deforestation and single-crop agriculture the inhabitants degraded the land until it could no longer support the great metropolis on and around Monte Alban.

But ignorance of the ways our actions may adversely affect the environment still plagues us today.

A recent meeting of the Federal Water Pollution Control Administration and the American Petroleum Institute revealed, for example, that attempts which have been made to control oil spills with chemical dispersants may actually be causing more harm than the oil itself, and may be doing long-term and severe ecological damage. The FWPCA found that oil, when mixed with these chemicals, caused the mixture to sink into the sand at depths three times the depth of the untreated oil. And in the Torrey Canyon oil spill, in which a supertanker struck a reef off the southern coast of England sending 30 million gallons of crude oil oozing toward shore, more animal life was killed by chemicals than by the oil itself.

Why, we should ask, has man allowed himself to corrupt our waterways, eliminate our wildlife and forestlands, snarl our cities, and foul our air.

The answer is best given in a recent statement by Dr. Elvis Stahr, the President of the National Audubon Society. Dr. Stahr said we have allowed ourselves to slip into this situation because "there persist tragic inadequacies in man's understanding of nature, of his own relations to it, and what he must do about them and how." He went on to say further that "many who ostensibly are well educated do not understand why it is happening, and far too few are as yet committed to finding and spreading the necessary knowledge and acting upon it while there may yet be time."

Fortunately there are signs that young and old alike are growing to appreciate the delicacy of the balance between man and nature and the care which must be taken to maintain it. But students must be taught in school to appreciate the environment and to become aware of our problems in preserving it. Students are required to take English and history, and at least become aware of biology, physics, chemistry and perhaps zoology. But that awareness has not been put together into a real and systematic understanding of our life support system.

Education has a responsibility to give its students the tools to read the signs of pollution as well as poetry, and our students today simply do not get the basic knowledge of their environment which they need to deal with ecological problems. Study of the environment should become part of the social science, not for reasons of esthetic or political considerations, but for reasons of survival. Our neglect in this area now is a serious gap on the body of knowledge which we are transferring to the younger generation. I believe it is a gap which can be closed in at least some small measure if the legislation before this committee is passed by the Congress.

Statement of Sam Gibbons, a Representative in Congress From the State of Florida

Mr. Chairman, Members of the Subcommittee, I am glad of this opportunity to reiterate my support of H.R. 14753, the Environmental Quality Education Act.

In addition to being in agreement with the general purpose of the bill, to make our citizens more aware of their place in the natural environment, and their responsibility toward managing it and its products sensibly, I am especially interested in Section 3 (3) which deals with Federal grants for educational institutions, agencies and organizations—to provide preservice and inservice training programs on environmental quality and ecology . . . for teachers, other educational personnel, public service personnel, and community, business and industrial leaders and employees, and government employees at State, Federal, and local levels.

The provisions of this section emphasize the need for more personnel trained in environmental understanding and know-how; people who will become active in the educational field, imparting their new knowledge to their students and to adults in the community; public service employees who will learn to deal with environmental problems in their jobs; industrial and business leaders who will apply accurate environmental data to the planning and operation of their factories and businesses; government employees who will be taught to establish, administer, and enforce effective and adequate regulations to safeguard a healthy environment, control and abate pollution, and restore damaged, depleted areas.

I feel that this provision could very well be extended to include the training of technicians who would specialize in operating and maintaining pollution control equipment.

Mr. Chairman, the persons you refer to in section 3 of your bill will have increasing need of properly trained manpower capable of operating, repairing, and maintaining control technology to abate air, water and solid waste pollution. We know that, despite our efforts, pollution is still increasing. This is due to our continuing industrial expansion, meeting the needs of increasing numbers of our citizens most of whom live in crowded urban areas. The problems of municipal waste disposal alone are staggering, and faulty, inadequate equipment is not the only culprit. For quite some time, there has been a chronic shortage of skilled manpower to operate disposal plants, incinerators, land fill projects and the like for municipalities and counties. Add to this the technicians needed for continuous monitoring, for routine inspection of plants to ensure compliance to city and county regulations and ordinances, and the technical personnel needed by industry to operate and maintain industrial control equipment. New technology is becoming available constantly to recycle and reuse many materials and substances used in manufacturing and processing operations, yet, once this equipment is off the drawing board, has been manufactured and installed, we are faced with a lack of technicians who will keep it going.

I believe that a very good source of potential trained workers capable of operating and maintaining pollution control equipment and instrumentation are high school graduates who have received specialized training in a vocational training institution or a junior college. Such specialized training, for a year or two following high school graduation, would include basic courses in environmental sciences as well as on-the-job training which will pave the way for independent work.

I feel that instruction and technical training at the post-high school, junior college level is not being sufficiently emphasized in environmental quality education. We generally talk about elementary curricula and teacher training at the elementary and secondary school level, in colleges and universities, and for adult education programs. Yet, when we seek out and try to motivate potential technical and maintenance personnel for pollution control installations we need not look for college graduates: our institutions of higher education are already turning out professionals who can design, install and manage such plants for both government and industry. We do need people with sufficient education to understand the sophisticated instrumentation and machinery which control pollution in order to ensure continued efficient performance. For this purpose, the community junior college or vocational training school is ideal.

In order to be motivated to embark on a career as a pollution control technicians, many high school graduates would no doubt have to be paid while training, and their specialized instructions would have to be subsidized. In addition to the proposed provisions for this purpose incorporated in the Environmental Quality Education Act, I feel that the Manpower Development and Training Act would also be a useful vehicle to accomplish our purposes. This legislation provides education and training to all types of workers who need not have college degrees or special educational backgrounds to quality for assistance under the Act. I believe that it can provide the needed impetus for the increasing supply of technicians we will need, especially at the local municipal and industrial level.

Another useful feature of both the Manpower Training Act and the Environmental Quality Education Act is that neither limits education and training to too narrow a scope. Many training programs operated by either the National Air Pollution Control Administration or the Federal Water Pollution Control Administration are designed for either air or water pollution control installations only. I believe we do the young trainee an injustice by narrowing his future pollution control expertise in this manner. He should be qualified to work within the whole range of pollution control field, employable by either government or industry. And since without proper planning, abatement of one type of pollution frequently leads to increased pollution of another kind, training along broader lines can be especially valuable.

On March 11, I introduced a bill, H.R. 16422, which would amend the Manpower Development and Training Act to develop and carry out training programs for the maintenance and operation of sewage treatment works and air pollution control facilities. As a former member of the House Education and Labor Committee, I helped in developing this legislation and believe it has proven its worth in training many persons for vital job classifications. I believe it can do the same for environmental programs. Certainly, enactment and implementation of the Environmental Quality Education Act will provide better environmental education in the high schools and lay a solid basis for the training program I have in mind.

STATEMENT OF HON. LEE H. HAMILTON, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF INDIANA

As a co-sponsor of the Environmental Quality Education Act, I welcome this opportunity to express myself on this critical issue. The subcommittee and its chairman are to be commended for holding these hearings, and I urge that prompt and favorable action be taken on this legislation.

It has become increasingly apparent that environmental quality cannot be exclusively concerned with pollution abatement. The simple taboo of "thou shalt not pollute" must be complemented by an essential concern with the quality of life we desire and the means of achieving it. Educating ourselves about our environment is one of the most important of these means, and can perform the necessary function of changing public mores to meet the needs of our future survival.

Environmental education, defined by the Pinchot Institute for Conservation Studies as "a recognition by man of his interdependence with his environment, and his responsibility for developing a culture which maintains that relationship through policies and practices necessary to secure the future of an environment fit for life and fit for living.", can become one of the most important tools to insure the rational use of our surroundings. It simportance is already apparent to educators like Stanley Campbell, Indiana Superintendent of Schools, who has informed me that many school officials and concerned citizens are aware of the tremendous need for including environmental education as an integral part of school curricula.

An initial step in the direction of environmental education has been taken with the passage by Congress March 25 of the Water Quality Improvement Act (HR 4148). The bill authorizes grants by the Secretary of Health, Education, and Welfare to higher education institutions to plan, develop, improve and carry out programs to train undergraduate students to operate water treatment works. Training grants could cover planning, curriculum preparation, and the development of experimental projects.

Passage of this bill is an encouraging sign, but it is but a small step in the right direction. What we need are giant steps like the bill we are discussing today. Its comprehensive approach to problem-focused education is just the approach recently recommended by an Executive Office of Science and Technology report on the the very issue of environmental quality. Giant steps are needed when one considers that because of America's high rate of consumption, production and waste disposal, 205 million Americans are depleting the world's resources and polluting the natural environment more than the 2.5 billion inhabitants of the less developed countries. The average child born in the United States will but at least 25 times as much stress on the environment as the average child born in India.

It is because of facts such as these that I co-sponsored and support this bill.

If we are truly concerned about the quality of the environment and the quality of life this concern must be illustrated and participated in by our educational system. Through the Environmental Quality Education Act, we can work to achieve the worthwhile aim of a national philosophy which inhibits against damaging our physical environment and which desires to leave it in better shape than that in which it was found.

STATEMENT OF HON. SPARK M. MATSUNAGA, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF HAWAII

Mr. Chairman and members of the Subcommittee, thank you for this opportunity of presenting my views with respect to H.R. 15511, the "Environmental Quality Education Act" which is identical to the original measure, H.R. 14753, under consideration at this time.

After many years of neglect, the rapidly deteriorating quality of our environment has finally become front-page news. We have finally come to realize that our physical surroundings are becoming increasingly polluted, less usable and less attractive. We have sadly discovered that utilization of our natural resources means, in many instances, exploitation rather than management, exhaustion rather than preservation. The man-made environment of our cities frequently excludes nature completely as we live in air-conditioned, push-button comfort in concrete structures surrounded by acres of asphalt.

Man has finally awakened to the realization that his natural resources are not limitless, that in order to survive, he must achieve a balance of use and restoration of his physical environment, that he must carefully preserve and manage his environment if it is to serve his children and future generations to come.

In order to enjoy continued quality and productivity, new attitudes toward, and new understanding of the forces that shape our living environment must be nurtured in our citizens. It is evident that mere concern is not enough, and while widespread public support of a more positive national policy on the environment is necessary for success, if the public lacks proper basic information and understanding of the consequences which poor environmental management produces, of trade-offs that must be considered, of short-term as well as long-term plans and projects to be developed and undertaken, public interest in environmental issues will be short-lived. As a consequence there will be no positive results—merely a string of temporary improvisations.

A good example of what happens when public anxiety is coupled with insufficient understanding and information can be seen in the present attitude toward land use planning. People all over the country are objecting to new sites selected for power plants, airports, transmission lines, highways and dams. Construction of nuclear power plants has been resisted in Minnesota, Illinois and Maryland, while Southern Californians have objected to fossil fuel plants. Opponents to the proposed jetport at the edge of the Everglades were successful in stopping construction, while pickets were active in Washington, D.C. concerning a proposed bridge across the Potomac.

Despite all the objections people still want the services derived from these proposed plants and facilities. They do not take kindly to "doing without"—they just don't want the plant in their own backyards, affecting their own property values or disrupting the surrounding landscape which they enjoy. They have not yet learned that truly effective land use planning involves careful and knowledgeable consideration of the broad environmental impact which goes beyond the destruction of the natural environment in any single area.

A general lack of knowledge of environmental issues was found in two public opinion polls conducted by the Gallup organization in January and July of last year. The pollsters found that while over 50% of the people polled were concerned with the present state of the environment, 16% did not know what to do about it; 10% could not identify the most pressing problem; 21% were "not sure" whether programs for the improvement of the natural environment received the right amount of attention and financial support from the government. And, on another tack, when asked whether they would agree to a $200 annual increase in living costs to finance environmental cleanup, 65% rejected the proposition; although, as the amount decreased, willingness to pay increased in proportion.

It can readily be seen that the proposed Environmental Quality Education Act will provide a timely and urgently needed program for alerting citizens of all ages to the whole subject matter of environmental management. Environmental education from the kindergarten through elementary and secondary schools, and continued at the adult education level via community programs, as well as more formally structured curricula, will be needed to narrow the tremendous gaps in public information which must be bridged soon if we are to embark on a meaningful national effort in environmental reconstruction. Matthew J. Brennan, of the Pinchot Institute of Conservation Studies, stated it well when he said:

"Present curriculums do not provide our people with any understanding of how man controls, transforms, uses wisely, preserves, or destroys his world, or how he is dependent upon it."

The proposed legislation would engage the full range of education resources at all levels to provide better instruction and more constructive teaching aids. I believe that, in addition to the lack of a meaningful curriculum, out greatest deficiency is in teacher training. Teachers have long complained that they lack the knowledge, as well as the tools, to provide adequate environment education programs for their students. At a meeting last December at the American Institute of Architects in Washington some 25 teachers' organizations and professional societies urged quick action in environmental curriculum development and training and expressed their concern over the widespread reluctance at the administrative levels to include meaningful environmental material in existing courses on conservation, especially at the elementary school level.

The picture is not altogether bleak, for effective experimental environmental education courses are being taught in public schools in several areas. Findings derived from these experimental courses can hopefully be augmented by new teaching materials developed by colleges and universities with grants proposed under the Environmental Quality Education Act. Many institutions of higher education including teachers' colleges, already have interdisciplinary programs in environmental quality and could be of considerable help. A recent survey of the House Subcommittee on Science, Research, and Development entitled, "Environmental Science Centers at Institutions of Higher Education," found more than 100 such centers in operation, allied with existing programs in schools of public health, law, engineering and city planning, biology, chemistry, the social sciences, and others. In them, varied and imaginative environmental programs are being tried, and many more are being planned. I believe that such programs could be adapted for use in high schools and adult education courses and that curricula for elementary schools could well be based on them, especially field study courses.

I am confident that the provisions of the measure before us today will greatly contribute to a nationwide understanding of the forces which shape our environment, and to the widespread dissemination of vital information on environmental rehabilitation, so necessary to a reversal of the present trend. I therefore urge your favorable action on H.R. 14753 and look forward to its early enactment and implementation.

Thank you very much.

ASSEMBLY, CALIFORNIA LEGISLATURE,
Sacramento, Calif., April 28, 1970.

Hon. JOHN BRADEMAS,
House Office Building,
Washington, D.C.

DEAR JOHN: I want you to know how much I regret not being able to respond to your invitation to appear at the field hearings in San Francisco before the Select Subcommittee on Education on behalf of your Environmental Quality Education Act. I should at least like to take the opportunity to present my thoughts on this subject, since it is of much concern to me.

I am concerned with what is happening not only to our State, but to our entire physical and social environment. But in searching for actions which can best help us respond, I am beginning to see relationships between disruptions to the biological ecosystem and disruptions to what I might call "the ecology of social relations", the "ecology of political responsiveness", and the "ecology of institutional structure". In every case, these disruptions take the form in which the separate functions of the parts no longer contribute to the well-being of the whole In nature, this spells biological disaster; in government, this spells institutional inadequacy.

I see much more in the Environmental Quality Act than just a stimulus toward environmental education. I see it as a first step in helping to redefine both educational and governmental institutions in ways that can make *both* more responsive to the needs of today. And I see our ultimate survival hinging upon *both* types of response.

The remarkable feature of the modern conservation movement is that we in government are being educated and counseled by those students and people who *care*. And as I see it, your bill would provide assistance for programs that would originate *within* the colleges and high schools and grammar schools, as well as those programs that would originate within the communities. The thrust of your bill is to have these same programs reach out to those who are already out of school, who are either themselves teaching school, or who are making the policies which affect the destiny of our State, while also permeating all levels of education. In my opinion, this provides an essential balance.

Perhaps, at long last, this will help us to get away from the "wise use of natural resources" as our only way of environmental thought, and bring us closer to "the wise understanding of the natural world".

In the Environmental Quality Education Act, I see a unique opportunity to assist people to reeducate themselves, and to stimulate states and communities to play a much more constructive role in determining the quality of their own future.

Passage of your bill, and the appropriation of sufficient funds in support of your program, would have immediate benefit in California on two fronts: first, it would help *us* define a better structure for our State and local educational institutions, to meet the needs of *today's* society; and second, it would provide financial assistance to enable us to move ahead without further delay with our own environmental education programs. We are in the shameful position in California of having passed laws *requiring* conservation education and counseling in grades one through 12, without having appropriated *any* state funds to support this.

It is clear from the intent of the Environmental Quality Education Act that the states could not rely solely on federal support, but rather that federal funds would be used to *supplement* State funds. I applaud this feature, for it means that California will have to recognize its *own* responsibility to the national effort: California will have to *act*, rather than just talk *about* environmental education.

I sincerely hope that not only will the Environmental Quality Education Act be written into law by Congress and by the President, but that it will receive the benefit of a *major* appropriation of funds, so that it won't suffer the fate of our conservation education programs in California.

I might even venture to add that, at a time in which "the reordering of priorities" appears to be the order of the day, we might weigh the environmental impact of the federal government's $290 million in funds, presently slated to support a technological boondoggle which I do not wish to see over the State of California—the SST—with the impact that the same amount of funds would have in supporting the programs spelled out in the Environmental Quality Education Act. If there were ever a need for new priorities, and an immediate redirection of institutional response, this is certainly one.

Let me know if I may be of further service.

Sincerely,

JESS UNRUH, *Assemblyman.*

AMERICAN ACADEMY OF ENVIRONMENTAL ENGINEERS,
Arlington, Va., April 9, 1970.
Hon. JOHN BRADEMAS,
Chairman, Select Subcommittee on Education,
House of Representatives, Washington, D.C.

DEAR CONGRESSMAN BRADEMAS: The American Academy of Environmental Engineers deeply appreciates your request for comments on the proposed Environmental Quality Education Act, H.R. 14753, which we received from Miss Orth on March 26, 1970.

This proposal recognizes the need for public participation in environmental quality by all citizens. Environmental problems affect all of us and their solution will involve public commitments through tax dollars, through essential expenditures such as food and shelter, and through optional expenses such as transportation and recreation. The average citizen must be made aware of his personal involvement as a contributor to pollution and of the need for his continuing support in order to arrive at optimum solutions.

Although the bill infers as much, I particularly wish to emphasize the broad dependence upon general education as a basis for educating the public in the environmental area. Courses in history should give more emphasis to the association between the development of Rome and its capacity to establish adequate water and waste disposal systems. These systems made urbanization possible 2,000 years ago, whereas smaller cities without essential sanitation were troubled by plagues 1,500 years later. Water-borne disease was not effectively controlled in the advanced countries until the field of bacteriology was developed in the late 19th century and engineers translated this knowledge into workable systems which produce sufficient potable water for large populations.

The adequacy of these systems is now properly being questioned for a number of reasons. Expanding population provides little space and time between discharges from one community to the water supply of the next. While bacterial contamination is now under control, there are still legitimate questions about viruses, chemical wastes, pesticides, and the interactions of all of these agents in the human body and in the biosphere generally. However, legitimate scientific questions should not be immediately projected into disaster. Rather, the citizens must consider the environment as a matrix of sources and exposures, each with its own benefit/risk, equation and with inter-related benefit/risk factors. A properly trained interdisciplinary group of professionals can assist by quantifying many of the variables, but the basic decisions must be made by the individual and through group action of non-professionals. Let me give some examples. As an individual, the citizen can choose a disposable or returnable bottle; can select a more specific and less persistent pesticide; can buy an automobile with minimum power for its basic purpose, can operate his car, radio and television set to produce a minimum of noise; and can select electronic equipment such as microwave ovens and television sets with proper radiation controls.

As a citizen the individual must also participate in group decisions which balance industrial sources and environmental quality. He must know that other sources can both improve and threaten the environment, depending upon their use, concentration, and disseminating characteristics. For example: phosphates can improve plant growth but may create an overgrowth of plant life in water supply sources; poorly designed solid waste systems may result in a small cost for trash services but can be unsightly, harbor rats, and can be a major local source of polluted air; a cheap source of electric power can contribute to air pollution and adversely affect aquatic life; and in the application of pesticides the individual must apply the materials to produce a maximum effect on the target organisms while limiting its dissemination and effects in the environment.

The citizen must understand that optimum solutions do not always involve the same administrative techniques. Everything cannot be improved by regulation and standards. In every case, however, the optimum solution involves several steps:

(1) Assessment of exposure including monitoring and evaluation;
(2) Evaluation of efficiency of alternative control techniques;
(3) Study of the impact of controls on related public and private interests; and
(4) Selection of the optimum system.

It may be that two pollutants are considered equally undesirable, such as automotive discharges and household wastes. In the instance of automotive discharges, the proper regulation of automobile design and fuel production can be a major factor in control. The industries exist and can be regulated. In the instance of household wastes, some type of effective public utility must be created so that a system will exist which can be affected by regulation or other administrative means. Often this requires new legislation providing for the establishment of new authorities which cross political boundaries. An example of this thinking is the proposed Maryland State Waste Disposal Act.

Before commenting on the specific provisions of the bill, I wish to congratulate you for recognizing the importance of mass media in the motivation of people. It could well be the most effective means for influencing proper environmental decisions in the future. In addition, such materials would help mothers to explain the need for children to improve their immediate environment from the viewpoint of food, sanitation, radiation, and pesticide usage.

Although your bill may provide by implication for the broad educational effort suggested by the statement of purpose, I would suggest that certain changes be made to increase its effectiveness.

1. Implementation of the legislation would be enhanced by placing the statutory authority for its execution in the Secretary of HEW, instead of the Commissioner of Education. This provision would enable the several environmental and health programs of the Department to better contribute their expertise towards implementing the legislation.

2. The legislation does not seem to provide for education of the specific professional disciplines which are essential for environmental assessment and for the development of alternative solutions. One way of strengthening this aspect of education is to place authority for the legislation in the Secretary of HEW, who could then establish a professional manpower program within HEW to review grant applications in the professional and scientific areas. The intent of the bill would be further clarified if provisions were made for financial support of students pursuing a curriculum in the field of environmental education.

3. The language should be clarified to give emphasis to incorporating environmentally related teaching materials into all science courses and related courses such as economics, history, geography and law, as well as an environmental science curriculum *per se*. It should be the intention to weave concern for and understanding of the environment through the entire fabric of the elementary, secondary, and college educational experience using adequately trained teachers backed by the findings of professional practice and research.

4. It is respectfully urged that provision be made to have at least one member of the Advisory Committee be an environmental professional with an actual problem-solving background. This will help to insure an affirmative approach to solving, as well as recognizing, problems.

5. The intent of the Congress would be clarified by providing for appropriations in specific amounts. This would be useful to the public, the Congress and the Executive Branch. It is respectfully suggested that this appropriation be in the form of a limitation of at least $5,000,000 for any one fiscal year up to F.Y. 1975

On behalf of the membership of the Academy, I wish to thank you again for the opportunity to comment on this important legislation.

Sincerely yours,

JAMES G. TERRILL, JR., P.E.,
Executive Director.

ARKANSAS POLYTECHNIC COLLEGE,
Russellville, June 10, 1970.

Mr. JACK DUNCAN,
Counsel, House of Representatives, Committee on Education and Labor, Select Subcommittee on Education, Washington, D.C.

DEAR MR. DUNCAN: The American Association of State Colleges and Universities (AASCU) has a vital interest in improved environmental education and therefore an interest in the approval by Congress and the President of HR 14753.

The Association comprises the fastest growing segment of American higher education at the bachelor degree level. The 273 member institutions enroll 25% of the national total, grant over 30% of the bachelor's degrees and prepare 50% of the nation's teachers. The latter fact is especially important to our interest in environmental education.

The AASCU Committee on Environment, of which I am Chairman, plans to actively promote and encourage improvement and expansion of environmental education service in our member institutions. A list of the members of this committee is attached. As an overall objective we hope to assist in a national goal of changing contemporary societal behavior toward more ecologically sound behavior. We see several ways in which the curricula of our member institutions can be improved toward the goal of a better national understanding of environmentally and ecologically sound behavior.

1. *General education.*—Regular courses in environmental issues should be available to virtually every student pursuing a bachelor's degree in an AASCU institution.

2. *Teacher education.*—Curriculum development in this area should include work for both pre-service and in-service teacher education. The fact that AASCU institutions train 50% of the teachers is a major reason for the emphasis on this type of curriculum development. A great multiplier effect occurs through the development of an understanding of environmental problems by teachers which can be transmitted to their many, many students.

3. *Community service.*—One of the hallmarks of AASCU institutions is Community Service. The field of environmental education is especially appropiate for this because environmental problems affect virtually every community.

4. *Research.*—Although AASCU institutions are not major basic research resources, AASCU institutions do have a capability in some basic research, and a great deal of applied research for the solution of community, regional, and national environmental problems.

5. *Specific curricula for "environment" majors.*—There is a budding employment market for persons with a bachelor's degree in interdisciplinary programs including environmental education as distinguished from biologists, chemists, recreation specialists, etc., who have a more disciplinary approach. There is also a need for a supplementary bachelor's degree program as a sequal to the junior college associate degree for Environmental Manpower Technicians.

The Association also supports all possible inclusions of the population issue as an element in legislation related to environment. All hopes for an improved environment will be lost by serious overpopulation of this nation and the world.

Member institutions of AASCU are already heavily involved in activities in the environmental field. A summary of these activities is attached.

The AASCU Committee on Environment and the Association as a whole, strongly support H.R. 14753. We stand ready to provide additional information and testimony as needed and requested.

Sincerely,

GEORGE L. B. PRATT,
President; Chairman, AASCU
Committee on Environment.

AASCU COMMITTEE ON ENVIRONMENT

George L. B. Pratt, President, Chairman, Arkansas Polytechnic College, Russellville, Arkansas 72802.
James E. Boyd, President, West Georgia College, Carrollton, Georgia 30117.
Lyman Brooks, President, Norfolk State College, Norfolk, Virginia 23504.
Vernon F. Galliano, President, Francis T. Nicholls State College, Thibodaux, Louisiana 70301.
A. Sanford Limouze, President, Massachusetts Maritime Academy, Buzzards Bay, Massachusetts 02532.
E. A. Rodgers, Admiral, Superintendent, Maine Maritime Academy, Castine, Maine 04421.
Kenneth J. Shouldice, Chancellor, Lake Superior State College, Sault Ste. Marie, Michigan 49783.
Cornelius H. Siemens, President, Humboldt State College, Arcata, California 95521.
Kenneth R. Williams, President, Florida Atlantic University, Boca Raton, Florida 33432.
Board Liaison: James E. Perdue, President, State University College, Oswego, New York 13126.
AASCU Staff:
  Frank Farner, Director of Program Development.
  Sheran Hartwell, Program Associate.

A SUMMARY OF ENVIRONMENTAL ACTIVITIES IN AASCU INSTITUTIONS, JUNE 11, 1970

(Compiled by the AASCU Office of Program Development for the Committtee on Environment)

The AASCU Committee on Environment is advancing a rigorous effort to stimulate environmental and ecological programs in member institutions. A part of this program is informing all institutions of successful activities in other member institutions. Listed below are 33 activities in 29 AASCU institutions.

North Texas State University One of the Southwest's leading limnologists, or fresh water experts, Dr. J. K. G. Silvey, will study the ecology of the three lakes supplying Oklahoma City this summer, continuing the research into that city's reservoirs that he has conducted for several weeks each year since 1951. Dr. Silvey's research has been concerned with the elimination of bad tastes and odors in the water and reduction of evaporation from the lakes.

Eastern Illinois University has received an $18,960 grant from the Federal Water Pollution Control Administration to conduct a biological survey of streams in Coles County, to make a current record of organisms in the streams for comparison with conditions after construction of the Lincoln Reservoir.

San Jose State College The Environmental Science Institute at San Jose State College is planning its second in a series of conferences on man and his environment. The first conference emphasized physical and biological aspects of the environment; the second will look to socio-economic and socio-psychological aspects, as well as food, agricultural production of forestry. ESI was established in September 1968 by the School of Natural Sciences and Mathematics at San Jose State to become a major center for research and education in matters relating principally to integrated biological and physical aspects of man's environment. So far, the Institute has over 200 members and 50 organizational participants, including Federal, state and local government agencies, colleges and uuiversities, non-profit institutions and science-based industry. In addition to conferences, ESI has initiated activities in graduate and undergraduate education, the provision of advisory services, preparation of research proposals, and development of a repository of data and publications.

Western Washington State College is working out programs designed primarily to bring comprehensive information about their increasingly threatened environment to school children and their teachers, by establishing a Northwest Outdoor Education Center. The Center will serve primary and secondary schools with an interdisciplinary approach to the sciences, arts and humanities, in order to give school children a sound appreciation of the study of earth and life sciences within a natural environment. First step in building this center is underway at the college's 586-acre Whidbey Island site. Twenty school districts are sharing the planning for this project, now known as the Northwest Outdoor Education Laboratory. When the overall Northwest Environmental Education Center is complete, it will ultimately include other similar laboratories throughout the state.

Western Washington will also soon open its second cluster college, devoted entirely to environmental sciences. This upper-division institution, called Huxley College, will offer only interdisciplinary study of man and his environment. Huxley, itself, will be a part of the planned Northwest Environmental Studies Center. Washington's Western Washington will share direction of the Center with Washington's three other state colleges and two neighboring colleges. Gene W. Miller, former professor of Botany and director of the Center for Pollution Research at Utah State University, was named dean of the new college.

The department of continuing studies at WWSC will offer a series of television programs next fall on Northwestern Washington ecology and the future of the Puget Sound region. The series will be broadcast at prime viewing time and encourage public comment and feedback.

California State College at Fullerton just started an institute designed to share with secondary school teachers new scientific information about human ecology and to develop new methods of teaching this to students. Begun last September, and offered to 30 science teachers in neighboring counties, the institute ran until May 1970, airing the issues of water and air pollution, over-crowded population centers, the need for flood control and the overriding need for man to understand the limitations and potentials of his environment. Said an institute spokesman: "Our objective is to make teachers aware of the critical balance of nature that man must preserve as he continues to expand his living, working and recreational demands upon his environment."

Chico State College held a major conference on air pollution aimed at stimulating action to safeguard air resources. The two-day conference demonstrated today's real air pollution dangers and reviewed economic, sociological and political problems which entrench factors causing pollution. The conference was sponsored by the college, its extension service and its Political Science Institute on Local Government.

Frostburg State College (*Md.*) is managing a two-year pilot project in the Potomac River Basin. Problems surveyed under the pilot umbrella: Polluted water, poor mining practices which destroy and erode land, unsafe and insufficient roads, inadequate information and education for citizens and community leaders who would like to help solve these problems.

Florida Technological University has received a research grant from the Florida Department of Air and Water Pollution Control to help establish an Institute of Fresh Water Ecology at the university. The mission of the new Institute at Florida Tech is to assist state authorities to control pollution and weed growth, protect sport fisheries and other recreational facilities, and ensure water conservation within the fresh water natural resources of the state. The Institute will promote research and teaching in all areas of fresh water ecology and will serve as a center for conferences and a clearing house for information. In addition to state funds expected to total $93,000, FTU itself has budgeted about $47,000 for the program.

Cleveland State University's Institute of Urban Studies is offering a new undergraduate course on Environmental Problems and Planning designed for urban studies students and industrial and government workers. The course which is taught by instructors in chemical engineering, biology, and geology, centers around water and air pollution, solid waste disposal, and traffic problems related to new highway construction.

Cleveland State was the location of a conference sponsored by nine universities in Ohio and Michigan on May 13 and 14 to provide industry and municipalities with the latest information on the means and cost of pollution controls. The two-day meeting was expected to place 300 participants in direct contact with environmental control experts and displays of anti-pollution equipment.

State University of New York at Albany is the location of an organization of the SUNYA Chapter of the P.Y.E. (Preserve Your Environment) Club, which began at the Thomas School in Rowayton, Connecticut and is seeking to form chapters through-out the country, particularly in schools and colleges. Interest in the club at SUNYA is an outgrowth of a three-credit, interdisciplinary environmental forum course initiated last semester and developed over a two-year period by members of the College of Arts and Sciences.

State University College at Potsdam (*N.Y.*) has inaugurated a new seminar in local and national environmental problems. Thirty faculty members, additional faculty from Clarkson College of Technology, students, and local officials are expected to take part.

Bemidji State College (*Minn.*) has three active programs and others in the planning stage. Geographic location provides natural unspoiled ecological resources for astronomic, atmospheric, and earth science investigations. Undergraduate and graduate programs stress conservation of natural resources and investigation of special problems dealing with environment and conservation.

A group of scientists recently formed the BSC Center for Environmental Studies to answer some of the questions currently raised about the nation's natural resources, especially those of Northern Minnesota.

Northeast Louisiana State College A Committee on Environmental Research and Information will study problems related to the quality of the environment and ways to apply scientific technology to their solution.

California State Polytechnic College, San Luis Obispo President Robert E. Kennedy has formed a college-wide Ad Hoc Committee to Promote Elimination of Environmental Pollution by acting as a clearing house for ideas and a catalyst for effective action. The president called for appointment of up to two faculty members and up to two students from each of Cal Poly's academic schools plus representatives of the Student Personnel and Business Affairs Divisions and the Cal Poly Foundation.

East Central State College (*Okla.*) has been authorized by the Board of Regents to establish a School of Environmental Sciences beginning in September 1970. The new ECSC program will be one of three in the U.S. offering such a program for undergraduates.

Eastern Washington State College A committee will set up an Environmental Science Institute to study the problems of pollution and ecology in the region. Two projects already planned include study of the sewer system and the treatment of sewage.

North Texas State University A team of student and faculty micro-biologists evaluated a unique waste disposal system established by the Campbell Soup Company at Paris, Texas. In 1964 the company leveled and terraced 500 acres of eroded, depleted cotton land on which it planted grass. Water laden with grease and tiny food fragments flows slowly over the grass, and micro-organisms in the soil devour the organic impurities so that they are not swept into the general water shed. Some 99 percent of the impurities in the soupy waste water are removed by the process, one almost as effective as complex filtration plants. As a by-product, the process fosters the growth of grass, and the system turns out far more hay than surrounding crop lands. The NSU biology team helped establish the effectiveness of the system.

Bowling Green State University's (Ohio) Environmental Studies Center with a full time director, uses an interdisciplinary system which expects to draw most heavily from the disciplines of business administration, education and the liberal arts college. The Center plans a future consortium approach. Though the present scope of this work is limited, demographic and economic advantages of the surrounding growing megalopolis will provide incentive for growth. Slated primarily as a service capability for the community rather than as a study center, the Center aims to identify basic ecological problems and deal with their fundamental causes. Main emphasis will focus on pollution control and land utilization.

California State Polytechnic College at Pomona, using a decentralized approach, is planning to work in environmental design, the biological sciences and water resources management through the college's various departments. Located in an area with diverse natural conditions, their on-campus facility which can stimulate mechanically different types of climate is most useful.

Fresno State College provides instruction through its center of operations at Moss Landing Marine Laboratories. The program was initiated through cooperative action by five California State Colleges—Fresno, Hayward, Sacramento, San Francisco and San Jose. The center specialized in instruction and research in marine environment. It emphasizes field study executed and documented by students with independent research projects planned, and is open to upper division undergraduates and graduates.

Louisiana Polytechnic Institute's location provides opportunity for region-oriented research such as pollution due to extensive papermill manufacturing in the immediate vicinity. The Water Resources Center plans to expand its areas of education, research and public services, and to study and interpret developments in water resources. The program is open to undergraduates and to post and pre-doctoral for supplementary training.

McNeese State College (*La.*) has an Environmental Science Program which operates in a fertile region for concerted research studies. Natural resources and the area's petrochemical complex present a broad scope. Purpose of the program is to train sanitarians. Degree: undergraduate.

State University College at Oswego (*N.Y.*) enjoys easy access to lake areas conducive to environmental and weather modification studies. The laboratory program stresses the effects of Lake Ontario upon the surrounding area and vice versa. Open to undergraduate and graduate students.

State University College at Fredonia (*N.Y.*) is located in an area relatively free of contamination and pollution. The Lake Erie Environmental Studies Program researches the other Great Lakes, as well, and provides continuous monitoring of meteorological information and water quality. Open to undergraduates, graduates and post-doctorals.

Winona State College (*Minn.*) is located on the least polluted portion of the "greatest river system in the world." Its program encourages river research in line with its initial purpose of establishing and maintaining a Mississippi River research facility. Open to undergraduate and graduate students.

Wisconsin State University at River Falls uses its region to study problems related to maintaining quality environment in growing urban areas associated with modern agriculture. A scientific land management curriculum stresses environmental management, exposure to different resources, facilities and disciplines in natural resources. Purpose: to strengthen environmental quality control and land use planning. Open to undergraduate students.

Shippensburg State College (*Pa.*) President Gilmore B. Seavers has given the Director of Safety and Security the additional responsibility of serving as "environmental ombudsman." A telephone number is available for anyone on campus who wishes to make a suggestion or report a "violation" of the environment. These calls are taken by the ombudsman, with an electronic recording device putting service on a 24-hour basis.

Lamar State College of Technology (*Texas*) has a new program in oceanography which is being conducted by the science and engineering departments with participation by the Texas A&M University department of oceanography. All specialized courses are scheduled for the last two years, so that second-year students and junior college transfers can enter the program with no loss of time or credit.

Lake Superior State College President Kenneth J. Shouldice has announced a new two-year program in the management of natural resources to begin next Fall. The program, funded by a $39,000 Kellogg Foundation grant, will lead to an associate degree in natural resources management technology.

AMERICAN SOCIETY OF CIVIL ENGINEERS,
New York, N.Y., January 19, 1970.

Hon. JOHN BRADEMAS,
Chairman, Select Subcommittee on Education,
House of Representatives, Washington, D.C.

DEAR CONGRESSMAN BRADEMAS: Your January 9 invitation to comment on the proposed Environmental Quality Education Act (H.R. 14753) is most welcome, and I hope that you will find these views to be both constructive and helpful to you and your colleagues.

Before discussing the bill itself, I would like to offer a word of caution with regard to the manner in which we should develop public concern with the quality of our environment. In some respects this has already been carried to extremes by certain well-intentioned conservationists, some publicity-seeking opportunists, and even a few politicians in their zeal to champion popular causes. As a result, there have been many irresponsible scarehead statements and omens of doom that have brought emotional reactions bordering upon hysteria from some segments of the public.

This emotional reaction is highly inhibitive to the programs and projects that are needed to improve environmental quality. It is interfering seriously with our rational analysis and approach to specific problems, and will cause increasing delay and waste of money and resources in bringing about their solution. Particularly unfortunate is the tendency to impose unrealistic standards and unduly burdensome controls as the result of ill-founded public pressure.

Our standards of environmental quality must be realistic and achievable within our technological and economic capacity. This does not mean that these standards cannot be raised in the future, of course, as we become able to meet them. They should be dynamic.

It is respectfully urged, therefore, that you base your environmental education program on the premise that our present environmental problems have arisen from an advancing technology in the service of a burgeoning population, and that this same technology has solved many of these problems, it is now solving others, and will continue to solve those of the future. Public confidence and support of such efforts is vital, but irrational public pressures only add new dimensions to the complexity of these problems.

With regard to the bill, I heartily endorse the statement of need for the legislation as set forth in Section 2(a). In its purpose, however, I respectfully urge that primacy be given to public information and education in the broad sense rather than to formal education through academic curricula and teaching. My reasons follow:

1. The need for *adult* education is immediate so that the public will support environmental programs that are needed today. We must educate the spectrum between the casual litterbug and the industrialist who conceives such atrocities as undisposable packages. We need to reach the individual householder as well as the real estate developer and mass housing entrepreneur. We need to engender the support of the taxpayer and consumer who must pay for the control of air, water and land pollution as well as the municipal and industrial officials who make the key decisions in these matters.

2. The inculcation of environmental awareness in our children and youth is very important as a long range goal, but I am not at all sure that it can be taught like arithmetic or chemistry. It seems to me that this is more a matter of training and general character development in the youngster. Such training will be enhanced if parents and teachers are strongly conscious of environmental quality.

The provisions in the bill for training of teachers are very good, and could be given even greater emphasis. Concern and appreciation for environmental quality should be woven through the entire fabric of the elementary and high school educational experience. I do not, however, consider special environmental curricula or courses to be practical.

Special non-academic programs for reaching children could be extremely effective, and should be covered in the bill. I refer here to such media as the comic book and the animated cartoon on television. These are powerful tools.

I am not enthusiastic about the proposed use of funds as set forth in Sections 3(a), paragraphs (1) and (2) of the bill. I subscribe strongly, however, to the uses of funds proposed in Section 3(a), paragraphs (3), (4) and (5).

The Advisory Committee on Environmental Quality Education proposed in Section 5 of the bill could serve a highly worthwhile function, and I would endorse this provision. It is respectfully urged, however, that the membership of the Committee, as prescribed in Section 5(b), include one or more environmental design professionals with actual problem-solving background. This will afford insurance against the scaremonger syndrome on which I have cautioned at the beginning of this letter.

Thank you again for the opportunity to express these views. I am intensely interested in bringing about the understanding, rapport and cooperation that is so sorely needed between the public and the civil engineer as a "professional environmentalist." Your legislation is certainly a significant proposal toward that end.

Sincerely,

WILLIAM H. WISELY,
Executive Director.

MANAGING KNOWLEDGE TO SAVE THE ENVIRONMENT

(By McGeorge Bundy, a Ford Foundation Report)

There is a characteristic impulse in our society to turn to education to solve complex social problems. This impulse was exemplified by the flood of attempts at curriculum reform in science and math that followed the launching of Sputnik in 1957. The emergence of Russia's scientific eminence was seen as a threat to national security and the scramble was on. So it is that Congress, reflecting the public's concern over the deterioration of the physical environment, is now considering two bills which would support educational programs designed to protect the quality of the nation's environment. This congressional effort may well reinforce the efforts of those educators and laymen who have worked to develop programs in conservation, outdoor education, and the natural sciences for our schools during the last few years. While this source of potential support can only be welcomed, some hard questions should be raised by the expectation that our schools can achieve the social goals which are implicit in this challenge.

Senator Gaylord Nelson, in introducing the Environmental Quality Act in Congress, recognized that the problem of checking environmental deterioration is largely a behavioral one. He then made the following statement:

> Education, I believe, is the only proper way to influence values, attitudes, and basic assumptions in a democratic society. Behavior, in the long run, can best be changed through the process of education.

A number of questions ought to be asked about this statement. For instance, what kinds of behavioral changes are needed to halt environmental deterioration? Who is to prescribe them? How are they to be achieved through education? How are behavior and social values now affected by our school systems? I suggest that if we really examined these questions we would get some unexpected answers, that the assumptions on which much of our current environmental education are based are of questionable utility, and that we have not yet come to grips with the underlying basis of the environmental problems which face us.

The values which affect society's behavior toward the environment are fundamental, widely held, and deeply involved with our perceptions of the world around us. For instance, as a society we attach an almost mystical importance to the inevitability of progress and to the value of economic growth. So much so that we seldom examine these ideas, even though they are by no means shared by other people around the world or even by all segments of our own society. Progress, of course, is not inevitable, and growth, whether in human population or in gross national product, has finite limits. The fact that we continue to behave as though this were an infinite world, even though we clearly know better, leads us to some pretty grim conclusions about the future of our society. While one may disagree with the doomsday prophets predicting ecological disaster in this century, the trend is clear enough.*

Schools and Values. If our behavior toward the environment is indeed based on unexamined values and faulty assumptions, then it should be the business of education to examine these values and challenge the assumptions. While this idea sounds revolutionary, nothing less direct will stand a chance of being effective in changing social behavior. After all, our assumptions about the nature of the world and our role in it are widely held in society because they are constantly reinforced. The communications media, the behavior of our peers, and even our folk culture confirm our perceptions of the world. Examination of these perceptions must start with our schools since they also tend to reinforce whatever values are widely held by society at any given time. Indeed, they are one of the means by which we institutionalize our beliefs and transmit them to succeeding generations.

Much of this communication is done through implicit messages which are a part of the school environment and may or may not be contained in textbooks or other teaching materials. For instance, one of the most important messages from the point of view of environmental significance has to do with the child's perception of his role in society and of his ability to affect his environment, either for better or for worse. This is a particularly critical question in urban poverty areas where the effectiveness of the individual is so much in question. We can assume that a teacher who comes from a different cultural background and lives in a different neighborhood will not share the same environmental perceptions and concerns as his children. If, at the same time, that teacher has a low estimation of the ability of his children to relate to the broader social community in coping with their problems, a message of futility and isolation comes through to those children all too clearly. Students in more privileged suburban schools may receive different messages but ones which also have unfavorable implications for their values and behavior in relation to their environment. I would guess that it is an unusual classroom in which students are encouraged by either practice or example to examine critically that which is bad in their environment or to question at all the assumptions and values which underlie environmental deterioration. In general, we do not seem to give children a very high estimation of their ability to effect change or even to do more than passively cope with the environmental insults which our society has prepared for them.

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*For a particularly enlighting treatise on this subject see Garret Hardin's article, "The Tragedy of the Commons" in *Science*, Vol. 162 (December 13, 1968).

David Hawkins, an educator at the University of Colorado, often performs the simple test of examining bulletin boards and physical materials being used by pupils to determine what is happening in the classroom with regard to environmental education. It is rare that he finds any significant clues as to the nature of that specific physical and social environment surrounding a school. While there may be a map or two, most of the material is generalized and representative of any area of the country. Usually such physical evidence is a good indicator of the teacher's approach, of the children's activities, and hence of the kinds of learning experiences that take place in that classroom. A self-contained classroom isolated from the surrounding community provides a sterile atmosphere for learning about environmental problems, whether one approaches them from the point of view of their social or physical basis. But perhaps more importantly, this kind of classroom environment may impart implicit messages about the relevance of environmental concerns, messages with obviously negative implications for the way in which those children will perceive their role in effecting environmental change.

If we are to change the behavior of children through formal education, which is precisely the challenge before us, we obviously must understand and change some rather basic aspects of the school environment. Furthermore, education will have to be organized around the goal of teaching children how to be effective agents for change so that they in turn may participate in the social processes which shape their communities and their lives. Environmental education, when viewed in these terms, becomes a fundamental part of the school experience.

Much of the quite extensive effort at environmental education which has been mounted in recent years has been at quite a different level. The main thrust has been to teach children about the natural environment through interpretation of the landscape and the processes which change it. But this ecological emphasis, important though it may be in its own right, has been mounted from outside the school system and has seldom come to grips with the broader social issues which now concern us. Ecology as curriculum content is primarily useful in that it relates a great deal of diverse information about the environment and its processes. I do not question for a minute the importance of environmental learning in this sense, but in competition with other subjects it must remain a relatively distinct part of the curriculum and as such represents only a limited gain.

What is needed is a far more eclectic approach to education, an approach which would embrace many new kinds of learning experiences. These new experiences would be selected to involve students in the critical analysis of, among other things, the social values and interactions that underlie environmental degradation. A high priority would be placed on the processes of inquiry and problem solving but the focus would be outward into the community and on actual problems affecting the lives of the students.

Research by Students. A good example of this kind of environmental education is the water pollution research problem at the Tilton School in New Hampshire*. There the students learn about the science and technology of pollution by doing research on the water quality in local streams and lakes. In addition to learning a good deal of basic science, they also produce data that are useful to the Federal Water Pollution Control Administration. But rather than stopping at the academic

*See page 12 for a further description of this and other Foundation-supported environmental education programs.

boundary of their subject, the students then investigate relevant legislation on water quality, and finally pursue the economic and political consequences of the enforcement of that legislation. All of this is done using actual local problems as a case study. The behavioral objectives of the Tilton work have to do with the ability of the students to carry out a research program, produce acceptable data, and analyze actual environmental problems. I can only surmise that the implicit messages that are communicated to the students doing such work will have an important influence on their roles as individuals in society and with their responsibilities in relationship to their environment.

There are, of course, all sorts of barriers to initiating such open-ended work in the schools. The basic structure and organization of the classroom are often inimical to environmental education and teachers lack the training and experience to organize such programs. It is far easier to teach about the environment as a generalized subject with the support of textbooks and films than it is to conduct an open-ended inquiry into the specific problems of an actual community. It is also easier to relegate the entire responsibility for environmental education to specialists from outside the school system, perhaps at the end of a bus ride at a local nature center, than it is to embrace environmental education as a fundamental aspect of the overall curriculum.

Community Involvement. Changes in education are taking place, however, and there are trends developing which should make it easier to pursue environmental education in the classroom. For instance, in many urban areas there is a drive toward greater community involvement in the schools. This is more than a matter of control over the administration of the school, although that may be the prime motivation behind the movement. In fact, community education makes it possible to draw upon many kinds of community resources, both human and institutional, to support the educational program of the school. In Philadelphia at the Parkway School, in Baltimore's Dunbar High School, and in Chicago's Waller Cooley School, programs are either being developed or are underway in which entire segments of the curriculum are conducted in agencies of the municipal government, in businesses and in local cultural institutions such as zoos and museums. Efforts are also being made to involve representatives from the community and from local colleges in classes taking place within the school itself. The potential for environmental education is obviously far greater under these conditions than it has been in the traditionally more restrictive school. But this potential remains to be fulfilled and the opportunities for environmental education may not be recognized as such even in the schools themselves.

While the examples I have cited above happen to be high schools, there are similar trends developing in elementary schools. Here the line of attack is to break down the traditional concept of the self-contained classroom which has always limited the kinds of learning experiences provided by the school. Team teaching, to the extent that it involves teachers with a variety of backgrounds working in close cooperation with each other, has cracked the classroom wall. Further inroads are being made by schools experimenting with open-structure or with the integrated day*, an approach to education based on the work of John Dewey and Jean Piaget, but developed most fully in British primary schools. Here, as in the high schools, we are dealing with a potential for imaginative programming which has not been widely recognized, particularly on this side of the Atlantic.

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*The term "integrated day" refers to a way of organizing the classroom without the formal constraints imposed by fixed-length classes dealing with specialized, academic disciplines. It also implies an inductive, individualized approach to learning.

The significance of the integrated day for environmental education is profound indeed. It places an emphasis on an eclectic environmentalism based on the heavy use of materials found in the local environment ranging from building rubble to living plants and animals. It combines classrooms, breaking down the walls so that children can work together in teams on problems which interest them and which at the same time provide valuable learning experiences. It disregards the traditional subject area boundaries and follows a unified approach to learning which much more closely approximates the child's actual perception of his environment. It drops the rigid schedule enforced by periodic bells and allows the use of blocks of time to pursue problems which could not even be tackled in a more traditional classroom. In fact, after seeing an integrated day in process, it is hard to imagine how effective environmental education could be pursued in the elementary school under any less open-structured conditions.

An integrated day affords an opportunity to achieve certain behavioral objectives through the kinds of learning experiences that it provides for children. Thus the excavation of a pile of building rubble treated as a neighborhood archeological site might be used to teach children a good deal about exploratory techniques and problem solving as well as about the history, climate, demography, and so forth, of their community. But, in addition, the fact that the teaching deals with the immediate environment and involves children in an open-ended exploration of those surroundings carries an implication for the children that their own environment and their individual perceptions of it really count. This kind of individualized, child-centered learning which deals with the immediate physical surroundings certainly develops different and presumably more positive attitudes, values, and behavior toward the environment than the traditional, more structured approaches. Furthermore we can make the assumption that programs which involve students in attempts to solve actual environmental problems can engender a social commitment that may have a lasting effect on their behavior.

The more successful environmental programs have undoubtedly contributed to the willingness of the schools to open the classroom doors to new experiences. The great public concern over environmental degradation is now reinforcing that movement and the result may be the best chance yet for introducing behaviorally effective educational programs. To realize this opportunity schools must make use of that particular environment perceived by their students. In effect they must teach *through* the environment using the community as a source of learning experiences rather than *about* the environment as a generalized object of study. Furthermore, if schools are to affect the behavior of children in order to moderate society's impact on the environment, they must lead students to explore the social interactions and the whole system of human values, concerns, and assumptions which underlie our behavior. After all, the physical limitations of natural systems are constant, and technology is only effective in alleviating the pressures we place on our environment when we use it to that purpose. The key to preserving the human environment is inescapably the collective behavior of individual citizens. In the final analysis, the success of environmental education will be measured in terms of its ability to change the behavior of society.

Ford Foundation Grants in Environmental Education

A number of schools and other educational institutions have received Foundation assistance for programs that make imaginative use of the physical environment as a resource for learning. Patterned in part after environmental programs developed in the British primary schools, particularly the Nuffield science curriculum, these programs differ from the usual "nature studies" in that they deal with man in his environment and make heavy use of both human resources and physical materials found in the immediate local surroundings. In an urban setting, for example, the children explore the physical features of the city streets —such as patterns of traffic or water gushing from a hydrant—and then return to their classrooms to study these phenomena. In the process, they use and learn the traditional academic skills and subjects. The local environment approached in this manner becomes a vehicle for teaching skills and not just the subject of study.

The objectives of these programs are both pedagogic and social: to capture the interest of students by making use of their own perceptions and experiences and to channel this interest into constructive learning patterns, while at the same time stimulating a more sensitive awareness of the environment.

Among the environmental education programs for which grants have been made are:

Wave Hill Center for Environmental Studies (New York): In cooperation with the Herbert H. Lehman College, a branch of the City University of New York, the center is seeking to introduce the physical environment into the regular curriculum to stimulate the intellectual curiosity and growth of students in four elementary schools in Harlem and south Bronx. The project trains teachers by involving them in the preparation of work units that build on the experiences gained by the students in investigating the environment. A three-year grant of $150,000, approved in 1969.

Tilton School (New Hampshire): Patterned after an advanced science project developed for twelfth grade students at the University School in Cleveland, a Tilton school program is engaging students in the solution of one of the country's most pressing environmental problems—water pollution. Under the leadership of Joseph Chadbourne, now at Tilton, the Cleveland students collected and tested water from local rivers, reported their findings to a state watershed district, and testified before the House Public Works Committee on pollution in the Lake Erie region. A one-year grant of $65,000, approved in 1969, is assisting the training of teachers and students from various parts of the country in the techniques that were developed by the Cleveland students.

Althouse College of Education, University of Western Ontario: One of the first centers to draw upon the British primary school experience, Althouse College is working with teachers and principals in Ontario elementary schools to develop a broadened version of the Nuffield science program. A three-year grant of $223,000, approved in 1970, is training teachers to use local materials, resources, and experiences to deal with comprehensive environmental concerns. The program will benefit teachers in this country through exchange programs and through the production of films and other materials.

International Center for Educational Development: The center, a teacher advisory service to public schools in the greater Los Angeles metropolitan area, is seeking to exploit the opportunities for environmental education in experimental classrooms. The project focuses on four elementary schools in a wide range of local settings—in the urban-ghetto area of Watts, in a rapidly changing suburban area, in a suburban-rural environment, and in a small rural community—so as to offer a maximum number of topics and problems for exploration. A three-year grant of $140,000, approved in 1970.

National Audubon Society: To find ways of relating the educational programming at its five nature centers more closely to the needs of classroom teachers, the society is conducting workshops in cooperation with the Educational Development Center in Newton, Mass., and the Bank Street College of Education in New York for its nature center education staff and public school teachers and administrators. The objectives are to make the centers a more vital educational resource, to develop working relationships with local school systems, and to devise new approaches to elementary school science education. A three-year grant of $250,000, approved in 1969.

In addition, the Foundation has made grants to *Portland (Oregon) Public Schools* for an environmental science program for underachieving students that makes use of the Willamette River as an outdoor laboratory; to the *Massachusetts Audubon Society* to introduce environmental education in the heavily Negro Roxbury and Dorchester sections of Boston; and to the *WGBH Educational Foundation* for a pilot series of six television programs on the urban environment for fourth through sixth grade students. Entitled "If You Live in America, Where Do You Live?" the television series is scheduled to be shown over local public television stations during the summer of 1970.

The above grants are part of a comprehensive program in resources and environment in which the Foundation has been engaged since 1964. (Previously its support in the field had been channeled through Resources for the Future.) The focus of this program, in its broadest terms, is the perception of, the concern over, and the effort to do something about problems that arise out of the conflict between man's need to exploit his environment for economic use and the ability of natural systems to adjust to the consequences. Grants have been made for the training of resource managers and scientists in ecology, for the education of public and official opinion on the nature of the environmental crisis, for the acquisition of parks and open space, and for the development of new scientific methods for coping with the complexities of natural and man-made systems. Additional information concerning the Foundation's interest and activities in this field is contained in the booklet, *Ford Foundation Grants in Resources and Environment*, and in the reprint, *Managing Knowledge to Save the Environment*, by McGeorge Bundy. Copies may be obtained by writing the Ford Foundation, Office of Reports, 320 East 43rd Street, New York, N.Y. 10017.

STATEMENT BY JOSEPH J. BANNON, CHIEF, OFFICE OF RECREATION AND PARK RESOURCES, UNIVERSITY OF ILLINOIS URBANA-CHAMPAIGN CAMPUS

The Environmental Quality Education Act, Bill H.R. 14753, has been reviewed by the faculty in the Department of Recreation and Park Administration at the University of Illinois. We are enthused with the basic purpose of this act and endorse its passage.

The maintenance of the environment is a critical question at this time. Unpredicted stress is being placed upon our surroundings as our population continues to increase and our technology expands. It seems as though we are racing time itself in trying to gain the greatest value from our natural resources, without recognizing the fact that as we continue on this path of degradation there are no winners, save the "junk man". Always science is looked upon as the savior in times of crisis, but as pointed out in a statement by the U.S. National Committee for the International Biological Program, "each local (environmental) problem can often be allayed with a quick technological fix, but such a piece-meal approach usually shifts the place or time of the problem rather than eliminating it. Mankind is running out of both places and time." [1] As a nation, we are faced with meeting the issue of time and place and environmental degradation here and now! The proposed Bill H.R. 14753 will do much to assist in this confrontation and to bring about "a more livable environment".

Chief among these issues which must be dealt with is the issue of public awareness of the environment and its many problems. In certain cities of this country recognition of local environmental problems is not at all difficult. Smog, water pollution, lack of public open space, poor housing, solid waste disposal and public disorder are only a few of the issues which have in certain areas become virtually accepted as day to day nuisances and inconveniences. Surely, this is not the relationship man desires with his surroundings—if he has a choice.

Man must be made aware that there is a choice and unless the choice is made for an environment which is truly "livable" then the long-range implications for human activity are rather gloomy. As was stated by Dr. Richard A. Falk, Milbank professor of International Law, Princeton University, before the Congressional Committee on Effects of Population Growth on Natual Resourcs and the Environment:

"* * * The Federal Government issued a declaration of a state of environmental emergency with all the pomp and ceremony at its disposal. This may sound like a rather alarmist sort of proposal, but unless alarms are sounded, all prospects of coping successfully with the environment seem naive and sentimental.

"Therefore the first task of Government is to awaken the American people to the full and urgent reality of the environmental crisis."

The faculty of this Department sees the Environmental Quality Education Act, H.R. 14753, as being instrumental in bringing about this awareness.

Through the on-going efforts of well devised urban and regional planning we are making progress in securing vital environmental improvements and facilities. The school-park concept, the acquisition of more natural parkland in urban areas, and river clean-ups are being accepted as a few of the necessary environmental ameliorations. However, environmental education must develop along with these community improvement projects. Not only will education of this type point out the benefits of such projects to the citizens of a community, but it will also bring about a realization of proper maintenance of the community's natural environment. When the concept of environmental maintenance is accepted as a part of a community's goals then we are well on our way to establishing the proper ecological relationships of man and his environment.

THE ENVIRONMENTAL EDUCATION PROGRESS

As programs for environmental awareness are developed in the school setting it must be recognized that these efforts will not be typical of the old single subject concept. The scope of such programs must allow natural inter-relationships between subjects to develop, as well as giving the "student of environment" the opportunity to become a part of the natural setting. To be sure, such efforts mean the integration of students and environment under conditions which can be termed educational. Achieving educational benefits from this natural setting requires competent educators and leaders and suitable enivornmental settings.

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[1] Man's Survival in a Changing World, U.S. National Committee for the International Biological Program, Division of Biology and Agriculture, National Academy of Science—National Research Council, Washington, D.C. undated, p. 12.

This Bill, H.R. 14753, contains the elements to provide all of these essential features. At the present time the vast majority of this nation is receiving grossly inadequate environmental education. There are two major reasons why this vital area of concern has not been improved as quickly as it should. First, there is a genuine lack of qualified people to teach in this subject area and to give leadership to young people in the school setting. In addition, the program must be advanced on all levels in the community, and it requires trained people to work with adult populations of the community.

Beyond the element of providing leadership which is vital, is the concept of supply of natural environmental settings, including a viable system of park and recreation facilities. To be sure many activities will revolve around basic settings which already exist in community. However, to allow environmental teaching and individual participation to have its most positive results there needs to be sufficient financial resources available to present a broad program. Money must be available for busing school children, to provide the necessary teaching materials and above all the adequate resources to construct and operate such suitable facilities as nature centres, museums, observation stations, trails, and other facilities needed in proper environmental education. Throughout the country some of these facilities are being developed. However, this development must not only be part and parcel of the school and educational system, but it should also comprise an integral part of the park and recreation system. To date, the efforts have been limited, and they require much assistance. In all likelihood, the greatest assistance that many of the people who are constructing these facilities require is the promise of competent leadership to institute suitable programs when their facility is complete.

A building such as nature center may be erected, and stand open to the public but until a staff with sufficient environmental training is placed at the center to guide the efforts of the community it really does not function. Likewise, right within our existing school system environmental awareness will not be fully realized until more of the teaching staff are competent in the area of environmental studies. We of this Department, feel that it is in this regard that the Universities of the Nation have a vital role to play.

This Bill appears to provide the mechanism whereby environmental educations can be inaugurated at all levels of the educational system. Universities should be given assistance to enlarge their environmental education leadership programs and to have the opportunity to work with the community in a much broader role. In this regard, we of this Department see this particular aspect going much beyond the boundaries in our normal undergraduate and graduate curriculums. We visualize many specific short courses, conferences and seminars to assist such specialists as school administrators, teachers, park and recreation planners, administrators and interpreters, outdoor educators and others to gain a full perspective of environmental instruction. These people are then in a much better position to encourage local efforts toward the implementation of programs in environmental education.

In conclusion, we state, that this bill can provide a major thrust toward providing the mechanism for proper environmental understanding. Through proper environmental understanding, we visualize the possibility of regaining a livable environment.

SCHOOLS AND THE ENVIRONMENT

(By Edward A. Ames, a Ford Foundation Report)

The subject of your meeting, "The Management of Knowledge and Information," implies in its simple, declarative form a problem, a capability, and a potential, if unrealized benefit.

The problem is that in most, if not all spheres of inquiry and choice, quantities of raw information overwhelm in magnitude the few comprehensive and trusted bodies or systems of knowledge that have been perceived and elaborated by man. I'm thinking here not only of knowledge systems with predictive value, but also of information systematically organized to yield the benefit of comprehensive description. Where, for example, does the novice urban mayor turn to comprehend the dynamic interrelationships between transportation, employment, technology, pollution, private investment and the public budget; between housing, nutrition, health and individual motivation and drive? Where does the concerned citizen or Congressman interested in educational change go for the best available understanding of the relationship between communications, including new technology, and learning? Whom does the modern woman consult when she seeks comprehensive and reliable information on the psychological and biological implications of using "the pill"?

Yet if streams of unassimilated, and often unmanageable, information inundate us even as we thirst for understanding, computer information systems seem to offer unprecedented capability of addressing the age-old problem of integration. They promise this first, because of their vast capacity to store and recall data; and second, because of their usefulness as a speedy tool in sorting out orders of relationship and dependency between many separately observed phenomena.

And the faith of the modern rationalist is that the family of man can reap important social benefits if it harnesses the capabilities of modern systems of information analysis and storage to convert data into knowledge, and then applies the product as widely as possible to issues of social and personal choice.

If I have correctly stated the elements of the faith framing this assembly and its deliberations, then I register as more, rather than less, of a believer. At the same time, my interest and allegiance is engaged more by the theory and the potential for good of modern information technology than by the present state of the art of application.

The results from employment of computer analysis in the service of policy choice in military affairs and private enterprise have clearly been erratic, and ought to induce caution in other potential users. Even in these areas, where systems have relatively clear boundaries, and objectives allegedly lend themselves to precise specification, experience with application underscores the limitations of this new technology:

—its susceptibility only to data which can be quantified, and the distortions in judgment which will occur when non-quantifiable aspects are badly misjudged, or worse still, omitted entirely from the calculus;

—the direct relationship between the quality of raw data elements or inputs and the value of knowledge output;

—the necessity that one's theory or explanatory hypothesis bear at least a first approximation to reality.

Indeed, in light of the findings of recent Congressional investigations, one cannot avoid wondering whether it remains possible for even the most sophisticated and rigorous process of analysis to comprehend and master the complexities and uncertainties of modern weapons systems.

An Opening to Rationalism. With these limitations in mind, however, I want to suggest this morning that the endangered environment offers a large and urgent opportunity for exercise of the faith of the contemporary rationalist. If the popular press is any guide, the necessity of preserving and restoring the environment seems finally to have approached the top of mankind's agenda. Fortunately, some sectors of our body politic preceded the current, nearly universal alarm. With important leadership from Congressman Daddario and his sub-committee on Science, Research and Development, Congressmen Saylor and Dingell, and in the upper chamber by Senators Muskie and Jackson, Congress has led the way in suggesting the intellectual, managerial and economic resources that America can and should bring to this worldwide awakening. And while it seems indisputable, as President Nixon insisted last week, that prompt action is required now to restrain the processes that pollute, and sizeable commitments necessary to clean up the messy legacy of earlier indifference, we also have overwhelming need to learn more clearly how the myriad acts of man affect the stability of all of nature's systems.

As the Stanford study group on environmental problems of the National Academy of Sciences has noted in its recent appraisal of "the crisis," we cannot effectively manage the environment without knowing what it is, what it was, and what it can be. At present, we do not comprehensively or regularly measure environmental quality. We do not know how and to what extent it is changing and has already changed. Much of the information now gathered under the aegis of such environmentally oriented agencies as ESSA, the Geological Survey, the Bureau of Commercial Fisheries, the National Air Pollution Control Administration and the Federal Water Pollution Control Administration is obtained for special purposes. Not surprisingly, no agency is either assigned or assumes responsibility for conducting an overall, ecological evaluation of the quality of the environment nor is any common, interchangeable or comparable sampling method now being used, though the quality of the air, for example, quite clearly impinges upon the quality of water.

But if the first requirement is to conceive and install a systematic, comprehensive system of ecological observation and data collection, there is also a large need for analysis; for manipulation of information on a grand scale to identify simple correlations between independently observed and measured phenomena, and for testing of intellectually ambitious models of ecological reality to improve our powers of prediction and spur our defensive, preventive actions. If it now seems urgent, perhaps even critical to take the largest view of our environment and its interrelating sub-systems, and to address issues of strategic management and preservation, information technology fortunately makes it possible to do so for the first time.

Indeed, some scholars are now coming at environmental analysis from two sides: the economic and the ecological. Both approaches strive to understand the complex interrelationships of the parts of man-made or natural systems, and the causes of equilibrium or instability.

Each approach explores and seeks to identify relationships of dependency between independently observed phenomena. When considering a stream, for example, analysts attempt to define the relationship between discharge of specific amounts of organic materials at specific locations and need of the stream for oxygen at the same locations. Out of a series of such equations, they develop a mathematical model which at its best may represent a primitive skeleton of a complex system. Its formalized, quantitative relationships lend themselves to mathematical manipulation as verbal descriptions of reality cannot. With the goal, for example, of achieving a given standard of water purity in our stream, a good model should enable us to discern the range in cost of several alternative "clean-up" strategies combining elements of plant relocation and modified production methods.

Ecologists and economists have already demonstrated that model-building and analysis can yield more penetrating insights than might come exclusively from the logic of lay observation or common sense, and can also have practical application.

Mathematical models of whale populations have predicted within a 2 per cent error what the annual catch would be. These models could have been used to fix quotas at a level to protect whale populations and enable them to recover from the tragic overfishing of the past decades. That quotas have not resulted is a political, not a scientific outcome. Better, though still inadequate use has been made of models of the Pacific salmon industry, which show the most effective kinds of restrictions on fishing and which identify the occasions when their application will offer the most protection to salmon.

Economists at Resources for the Future recently challenged a plan by the Army Corps of Engineers to build a number of dams on the upper Potomac and its tributaries. The Corps proposed, in part, to construct these dams to hold water that could subsequently be released in dry season to dilute wastes in the lower river and thereby sustain throughout the year a steady standard of water quality. The agency's critics in R.F.F. constructed a mathematical model of the hydrology of the river basin and explored the cost of a number of alternative methods of assuring the given, as well as higher and lower water standards. They found that all alternatives (combining various treatment methods) were substantially cheaper than the proposed dams, and some would cost only one tenth as much.

To be sure, all these models have or could have practical immediate utility in saving whales, saving money, or insuring water quality. But more important for our purposes, they offer promising evidence that analysis of complexity can enhance the rationality of decision-making. Even if one knows that a reservoir is a more expensive way of keeping the Potomac clean than advanced waste treatment, one may still prefer to keep it clean in this more expensive fashion. Similarly, it is conceivable that a decision to exterminate whales might be deliberately arrived at. It is deliberation that the models make possible and, indeed, in some sense enforce—which is not the least of their social value.

For its part, the Ford Foundation seeks to contribute its full share to the creation of the expanded, action-relevant knowledge about our environment and the threats to it that time requires. Five years ago, the Foundation's Board of Trustees, upon the recommendation of my predecessor, authorized the development of a program in Resources and Environment*. The experience of our increasing effort in recent years suggests to us the very high priority that should be attached to study and appraisal of environment on the broadest scale. We have recently intensified discussions with scholars and public officials on this matter. While we have no formal recommendations as to ways and means to table at this date, we are encouraged to believe that there is a vital, complementary role that philanthropic institutions can play along with Congress, the Executive,

*See page 19 for a description of the program.

other educational and research institutions and indeed the family of nations acting in concert to facilitate the broadened intellectual attack these problems require.

International Environmental Cooperation. The environmental dangers we face, the systems to be understood, and the remedies to be fashioned will frequently be international in character, an aspect properly recognized by the recent, relatively underreported decision of Secretary of State Rogers to create an Office of Environmental Affairs headed by Mr. Christian Herter, Jr. in his office. I personally am convinced that energy for both rigorous study and prompt action must derive from national governments, and not be remanded to or anticipated from supranational agencies or voluntary assemblies of motivated individuals sharing the same concerns or intellectual training across political boundaries. At the same time, I also see important possibilities for international cooperation and collaboration in these urgent environmental tasks.

There is not only the manifest fact of our national interdependencies relative to the environment; there is also no obvious ideological basis for disagreement over causes or relative responsibility, or political gain to be realized from a posture of isolation. Indeed there is some reason to believe that even potential adversaries will welcome and be responsive to an initiative for communication and intellectual consultation on these complex scientific and technical questions. And there is certainly reason to hope that a fruitful intellectual consideration of our common stake in preserving the environment would facilitate discussion of even harder issues of common concern.

In addition to the political possibility for cooperation, there is the undeniable fact that we confront problems of awesome complexity. The intellectual talent which must be encouraged to address these problems is not only exceedingly scarce but also geographically and politically dispersed. Every experience that I have had in exploring issues of common concern with the intellectual and scientific leaders of other societies and states has confirmed what I have always felt in my bones to be true—that the best ideas or perceptions are likely to emerge from circles of intellectual competence deliberately made as inclusive as possible.

Thus as we launch this decade of attention to the environment, there is much to be said for activation and steady cultivation wherever possible of a workable process of international intellectual consultation and collaboration with nationals of countries that may be potential adversaries as well as traditional friends. This process will not happen automatically. It needs to be made someone's business, necessarily requires a new order of collaboration between the State Department, the science agencies, and the nongovernmental Academy, and ought to have Congressional encouragement as well as Executive direction.

One can conceive of three different levels of fruitful international exchange:

First, we should make every effort to insure that national systems for monitoring, collecting and storing environmental data are compatible. I believe early, serious effort across political boundaries to achieve intellectual consensus concerning the key phenomena to be observed, and the quality indices to be established will obviate dangers of poor or nonexistent linkages between mechanical national arrangements for collection, storage, retrieval and exchange.

Second, assuming as I do that each nation will independently pursue research and experimentation in remedial actions, information on work in progress, results and understandings, however tentative, must flow freely across political boundaries. There simply is too little time, brainpower, and public money for nations to operate either in a chauvinistic or unconsciously introverted fashion; for countries to run up blind alleys trod earlier by others, or remain ignorant of promising approaches under scrutiny elsewhere. The responsibility for insuring the necessary exchange of information in these matters rests with each nation and its interested intellectual community. The priority for public policy here, it seems to me, is the provision of resources for an expanded flow of personnel and information materials from points of national origin, rather than the creation of new, allegedly coordinative international agencies.

Third, when the necessary intellectual mobilization begins to yield operational applications, there will surely be opportunity for shared international effort. The developed countries will have their traditional obligations vis-à-vis the emerging countries, and new patterns of international law and management seem likely to be required with respect to our priceless, collective oceanic, inner and outer space assets.

Higher Education. The prospects for a successful defense of our natural environment, within our own political sphere as well as in cooperation with others, cannot be insured simply by a commitment to a deeper and broader intellectual inquiry, as fundamental as I believe that is. It will also depend upon at least two other factors which have historically been a concern of this annual gathering and which remain worthy of attention today. I refer,

First, to the health of our system of higher education; in particular, our system at the graduate level for the development of an adequate supply of professionals, skilled in many fields and motivated to tackle these vast, but imperative problems of public choice and policy;

Second, to the health of our political process, its responsiveness to the requirements of national welfare, its capacity for sober deliberation, wise choice and timely, effective action.

I, for one, share the anxiety that many feel today over the adequacy and well-being of each of these vital systems.

With respect to higher education, the problems are many and complex. There is, to begin with, the anxiety that many intellectuals feel at the seeming incapacity of American society to put first things first; the anguish they feel over their perception of a civilization seemingly awash in its own errors and excesses. It would be a serious error to blink at the increasing estrangement that many of the most gifted in the American Academy, and not just the young, feel toward the values that swirl and prevail in the larger culture and society that encompasses them and their work, and their inclination to withdraw from engagement with problems of that larger scene. At the same time, complementing this external criticism, there is a self-examination and search among many scholars for a fresh and vital definition of the tasks and role of academic men in modern life, an inquiry undoubtedly induced in part by the relentless probes of querulous students motivated to make a difference and not unrelated to the apparent obsolescence of many of the structural forms that have grown up in the contemporary university.

Yet if these enigmatic forces are easier to describe than to reconcile, my quick earlier survey of some of the dimensions of the intellectual challenges of environmental restoration may have suggested my personal conviction that no modern society is going to make it if it fails to connect up its muscular actions to a discriminating intellect. The demand for guidance and understanding by that intellect has never been greater, and not only with respect to the environment, but in the voracious demands of modern society for increased scholarly attention and more powerful intellectual insight concerning the learning process, the aging process, the reproductive process, urbanization, and all the forces compelling human adaptation and institutional change in the technological era.

In my judgment, the ongoing, many-faceted debate over academic purposes and values will find its focus in the intersection of the important questions of intellectual freedom with forms of educational finance, an emerging problem on the horizon of everyone's consciousness if not yet at the top of anyone's formal agenda. We have finally faced up to the distortions and dangers of channeling disproportionate amounts of federal aid for graduate training, research, and institutional development via the defense budget. We seem increasingly aware, as well, that grants of fragmented financial support for highly specialized, if appropriate educational objectives do not invariably coalesce a coherent or healthy community of scholars and students at point of destination.

But the broader national debate—in part, clearly, a political debate requiring initiation by responsible governmental leaders—which defines and affirms the goals of our system of higher education for both individuals and society, and the terms of national public support and accountability, has barely begun, and is increasingly urgent. In this necessary discussion, the Congress and the public have a right to expect the academic community to come forward in its turn with the professional, curricular, and organizational innovations and protections which an era of protracted engagement with issues of individual welfare and social policy will require.

Political Processes. Finally, I come to the knotty interaction of ideas and action—the capacity of the general and informed public no less than leadership in a democracy to make wise and effective commitments in policy and program when tested and reliable information is available.

I have argued earlier that the computer can help us achieve a more penetrating and encompassing understanding of the world's natural systems and how man impinges upon them. In the hands of men of powerful and scrupulous intellect, this modern tool can help us define the facts. But I have not asserted, nor do I believe that this intellectual process will define "an answer" or "the remedies."

For action, we must look to politics as the arena where facts are assayed and values collide, where interests compete and policy or stalemate results. And when the needed observation and wider analysis of our threatened environment is further along, I am inclined to believe that the necessary remedies and assessment of damage costs will cut profoundly across many of man's basic values, especially the economic ethic and motor of our existence.

This new knowledge of where we are, and perhaps of how late it is, will also place great strain on our political process. There will be no obvious, consensual and painless technical panacea available to us. We will not be able to avoid a widened definition of the processes of industrial production which embraces the full costs of safely disposing of or recycling waste materials. There will be sharp political conflict over the assignment of these additional cost burdens. There will be a clearer understanding of the price to the current generation of environmental damage unconscionably shunned by earlier eras; we may have indisputable evidence that further procrastination will lead to irreversible destruction. In his State of the Union Message, President Nixon has suggested the possibility of a conscious and active national policy of redistribution of population and he has also challenged the assumed identity between economic growth and individual well-being. He has thus identified two of the central topics of a far-reaching national debate on the future quality of our life. The values of our society and the quality of our politics will surely be tested sharply by such choices between adequate and insufficient action; by the assignment of the burden between producer and consumer, between private and public sectors, and between present and future generations.

In that great debate, we will be enormously dependent on the ability of men of scholarship and knowledge to communicate dangers, the range of promising strategies and operational urgencies in terms that are understandable to the general public and to those with political responsibility for action.

We will also need a political process both open and coherent. On the legislative side, it must afford opportunity for representation of view by individuals with a human interest as well as by organized groups with a more tangible economic interest; by the unvoiced, but nonetheless real stake of future generations as well as that of participants in the next general election. And in execution of the generally approved programmatic course, it should be strong enough to avoid bureaucratic splitting of the difference of underlying disagreement, tolerating or encouraging several Executive agencies to operate independently and in-consistently, undoing with today's directive or action on this side of town what was painfully resolved in someone else's office yesterday.

In the end, effective translation of the desire of man to preserve his environment will depend on the skill of the public man—the capacity of the individual legislator and of the Executive decisionmaker to sift evidence, to discriminate between theories, to interrogate the scientist-scholar, to reach conclusions and to help create the public support for the needed action.

In the era of information explosion, societies can become paralyzed over a plethora of facts and the absence of obvious conclusions. Or they may freeze when the indisputable facts and necessities offend received values and conventional wisdom.

Neither form of paralysis is likely when the linkages between the arena where policy is forged and the relevant circle of informed and disinterested citizens and scholars are firm and easy. This audience and its predecessor gatherings happily embody that value and tradition at its best. The agenda of your common concern is important evidence for the proposition that the discoveries of science and the disciplined intellect intend to serve, rather than overwhelm man as he sets out in a new decade to tackle his unfinished agenda of pollution, pestilence, population, personal productivity, and poverty.

Ford Foundation Grants in Resources and Environment

Although the Ford Foundation's interest in natural resource preservation and management dates back to 1953, when it helped establish Resources for the Future (R.F.F.), an enlarged resources and environment program began in 1964. Currently, the Foundation is making grants at the rate of $6 to $7 million a year in the following general areas:

Training and Research in Resource Management and Systems Ecology. The Foundation has provided the sole support for R.F.F., whose purpose is to advance the development, conservation, and use of natural resources through programs of research and education. R.F.F. has recently been engaged in designing resource management models of such environmental problems as stream and air pollution, pesticide misuse, and urban sprawl. These models are used to determine, for example, the costs and benefits of various alternatives of managing a stream to achieve selected standards of water purity. Grants to R.F.F. have totaled $26,455,000.

Other grants totaling some $6 million have supported training and research in resource management and systems ecology at eleven universities (British Columbia, California, Chicago, Colorado, Johns Hopkins, Manitoba, Pennsylvania, Princeton, Stanford, University of Washington, and Yale) and the Missouri Botanical Garden. The objective of these programs is to train a new breed of conservationist, capable of applying rational principles and methods to the management of resources.

Citizen Education. The Foundation has assisted the Conservation Foundation, the National Audubon Society, the Massachusetts Audubon Society, the Open Space Action Institute, and other groups working to bring educated public opinion to bear on a variety of environmental issues—from preservation of wetlands to checking the indiscriminate use of pesticides. For example, the Massachusetts Audubon Society publishes a magazine, newsletters, and other educational materials and provides consulting services to conservation groups in New England. The Park Association of New York City seeks to develop a constituency for the preservation and upgrading of New York City parks, and National Educational Television received a grant to produce a series of films, for showing in late 1970s, on man's effect on various natural communities of plants and animals.

Preservation of Natural Areas and Open Space. With the exception of a $1.5 million matching grant to Save-the-Redwoods League, Foundation grants to finance land purchase have gone toward the preservation only of areas of special scientific importance. Harvard, the University of California,and the Smithsonian Institution were assisted in acquiring land for biological field stations, and the World Wildlife Fund and the Philadelphia Conservationists received grants for the purchase of coastal wetlands. A $6 million loan guarantee is enabling the Nature Conservancy to acquire parks, forests, and wildlife preserves slated for purchase by governmental agencies but for which public funds have not yet been appropriated. More than 32,000 acres, ranging from tidelands in San Francisco Bay to an island off the Maine coast, have been acquired by the Conservancy during the past two years with the help of these funds.

Environmental Education. To help schools and other educational institutions make imaginative use of the physical environment as a learning resource, the Foundation has made grants to the Wave Hill Center for Environmental Studies, the Tilton School, the University of Western Ontario, the International Center for Educational Development, and the National Audubon Society. Unlike traditional "nature studies," these programs make heavy use of human resources and physical materials in the immediate local environment to stimulate intellectual growth.

On the undergraduate level, San Diego State College received funds to provide undergraduate biology majors with quantitative training in ecological problems, and Stanford University is developing a new human biology major on the interrelationship of man and the environment. The Stanford program, in which both social scientists and medical school professors are collaborating, seeks to reverse the traditional separation of the biological and behavioral sciences.

Waste Management Demonstrations. Grants have been made to Michigan State University to test the design of a sewage treatment system that will prevent the deterioration of lakes and rivers, and to Harvard University and a Boston community action group to demonstrate a comprehensive approach to the problems of waste disposal in inner-city neighborhoods.

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About the Ford Foundation: General program activities.

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The Newsman's Scope: Activities in the field of journalism education.

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Schools and the Environment: A paper by Edward A. Ames, Foundation program officer in resources and environment, prepared for the American Nature Study Society, December 27, 1969.

Conservation Education

(By Al Cline)

In a recent *Bulletin*, Lloyd Tupling made the sage observation that action frequently makes a mockery of words. So does inaction. The California State Legislature two years ago in a move heralded by some politicians and educators as a "magna carta" rewrote a large section of the Education Code, a difficult and controversial chore removing reams of useless verbiage. The goal was an educational process more closely related to reality.

Conservation education was mandated for all the grades—not suggested, but required from the first grade through high school to give students a sense of man's relation to his environment.

Wonderful! Another first for California.

The hitch was obvious. No funds were provided. So, to quote the Conservation Advisory Committee to the State Board of Education, conservation education remains a stepchild in the crowded family of education, "a bright and promising child, but ignored or neglected, with little nourishment of any kind."

The food that exists comes from individual teachers and a district or two relying on their own resources. The lack is particularly apparent in those vital early grades. A 114-page bibliography of free and inexpensive conservation publications compiled last year by a committee of educators listed nothing for first graders, a few namby pamby cartoon coloring books for second and third graders. "Smokey's Forest Fire Prevention Song Book, Snappy Songs for Youngsters," is one example. "Sniff and Snuff, the Super Fire Safe Snoopers," another. A sorry diet, indeed.

Mrs. Louise Brown, a science teacher at the Jefferson Elementary School in Berkeley, refuses to accept such fare. She teaches only first graders. They spend an average of 2½ hours a week with her, and Sniff and Snuff are not a part of the classroom. Ecology is. Eco-systems are. Pollution is, along with polluters. The six year olds delve into smog and DDT; organisms and habitats; water problems and the conservation of African animal life. No subject concerned with planet Earth is taboo.

The major goals to Mrs. Brown, a vivacious woman with 20 years experience in the classroom, 18 in Berkeley, are scientific leteracy and environmental education. Trained in the University of California Berkeley-developed Science Curriculum Improvement Study (SCIS) technique, a system stressing exploration, invention and discovery, Mrs. Brown emphasizes the diversity of organisms, both plants and animals. Her students observe the life cycle—birth, growth and death. They learn what makes water turn green what the black stuff is at the bottom of the fish bowl, what sustains life and what causes death.

When the students bring something from home, and they do this consistently, it is discussed with enthusiasm. The science room is covered with articles of interest: a news story and pictures of a Minnesota fish kill; an article on a new and complex system of converting salt water to fresh; that not so scenic Sierra Club poster depicting the rape of a redwoods stand.

"I try to make the children aware of what's going on around them," Mrs. Brown says. One lad spelled out his theory for eliminating smog, a simplistic idea perhaps, but to the point. "Make difrent ingin for cars, trucks and motor cicles." Others in a free-wheeling discussion on air pollution called for development of an electric auto, a steam driven car, and a return to the use of feet. In a discussion of pesticides a girl gave a lucid explanation of the role of DDT in the demise of the pelican. Using the Redwood poster as a takeoff, another girl left no doubt that she understood the cause and meaning of erosion.

This is Mrs. Brown's second year of working with first graders and she acknowledges that no one really thought her program would succeed to the extent that it has. The argument was that the kids just weren't ready for such advanced material, that their attention span could not be held for such a long (one hour) period.

But it is working.

"There is a terrific increase in vocabulary, in the ability to describe things," the teacher reports. "I get tremendous feedback from both parents and teachers. And the second graders continue to be as enthusiastic as they were last year."

An eighth grader and budding oceanographer who helps Mrs. Brown an hour a day expresses amazement at the goings on at Jefferson. He says those first graders are involved in subject matter he did not hear about until the sixth grade.

Despite her obvious enthusiasm, her conviction that youngsters must become aware of the world around them, Mrs. Brown does not consider herself an ecology or a conservation fanatic. "It is important, and I certainly am interested in it," she says. "But my major interest is in what I consider America's No. 1 problem, the survival of black people." Mrs. Brown is black.

"Conservation doesn't mean just saving birds and trees. It means saving people, all kinds."

She is disturbed by what she considers a consistent policy of pushing urban problems into the background. To her, there is something ominous about the plain fact that something always seems to come along claiming priority. "First it was Vietnam," she says. "Then it was inflation. Now it's the environment. I'm not saying anything is less important. I can't see why we can't tackle both at once. I hate being put in a position where I have to choose. That bothers me particularly as a teacher."

As do many teachers, she cares about her profession and the several hundred youngsters that come to her classroom. She provides many small items for the room in addition to supplementary SCIS materials, but knows she could offer much more if she had microscopes (the children do use magnifying glasses), and outdoor area "left undisturbed where youngsters could see for themselves the interrelationship among organisms," a pond and a small garden.

The hope for financial help to purchase such things appears to rest with the State Legislature where, at present, rhetoric is the major conservation commodity. Assemblyman George Milias has a pending bill (A.B. 1050) to establish a Bureau of Conservation Education within the State Department of Education with operating funds coming from a severance tax on crude oil, timber, natural gas, cement and gravel. "If we can spend $15 million each year on driver's education to teach our young people how to survive on the highways," he says, "we ought to be spending a comparable amount teaching them how to survive—period."

Milias, chairman of the State Assembly Committee on Natural Resources and Conservation, is optimistic, reading the "current tide as being deeper than rhetoric." Others in Sacramento are more cynical. The oil and timber and natural gas and cement and gravel lobbyists never have allowed severance tax bills to go anywhere. They are not likely to change now, tide or no tide.

However, a chance does exist for some other kind of financing, something akin to the driver education collection of extra traffic fine money. A bill is pending to preempt all highway litter fines for conservation education. The sum would be nothing like the $15 million Milias talks about.

Another assembly bill appropriates $176,000 to implement a statewide conservation education program. The figure is from the Administration. Governor Reagan spoke out for the conservation education at his Los Angeles conference on the environment. The budget contained no funds for it. The record, it seems, leaves little room for optimism.

In 1968, the California Legislature created a Conservation Education Service empowered to make grants to local districts. A sensible way for Jefferson to get its microscopes, pond and garden. Although the Service was established, no money was appropriated. Last year a master plan representing three years of effort was presented to the State Board of Education. The plan detailed programs and funding. The nine advisory committee members pleaded for prompt action. The report was accepted with great thanks. The ensuing silence has been deafening.

"Here is the State of California with a blueprint when the environmental crisis is being recognized nationally," says Committee Vice Chairman Peggy Wayburn. "We're talking on a far more profound level than pollution. That is just a symptom. There's a far more profound ill we have to deal with."

The State Departments of Fish and Game and Parks and Recreation both have education specialists and many worthwhile films and other types of useful material, but this cannot be considered a statewide program.

Mrs. Wayburn points out that other states, Colorado and South Carolina to name two, are progressing much faster. California does have a developer of conservation education programs. He is Rudy Schaefer, former National Park Service ranger, school administrator and conservation education specialist for Los Angeles, a position never filled, incidentally, when Schaefer left. He is in Sacramento doing his work with a $35,000 federal grant. It expires in June. The theory is that the State takes over when the federal money runs out.

What is more likely is that Schaefer's output—his reputation as a capable, knowledgable planner is outstanding—will find a convenient home on some dust covered shelf, and, due to lack of funds, may not even be published.

Mrs. Wayburn notes a master catalog of all available materials for teaching conservation education exists in Sacramento, but no money is available for printing. There also is a Handbook on California's Natural Resources written two years ago for teachers. It is out of print.

STATEMENT OF TOM DAVIS, ENVIRONMENTAL ENGINEER, BOISE CASCADE CORPORATION

My name is Tom Davis and I am an environmental engineer for Boise Cascade Corporation.

I have examined HR 14753, which proposes an Environmental Quality Education Act, in view of its ramifications to our Company and the business community. In that regard we enthusiastically support HR 14753 and urge this subcommittee to direct it to an early enactment.

Far too often business has assumed that communication with the public had to be oriented primarily toward complimenting the organization image. Consequently, many of the hard facts of the business world have not been injected into the rapidly increasing current of public information. Paradoxically, industry and business have probably suffered the most from this isolationism. The public doesn't understand or sympathize with our problems, we often do not understand or sympathize with the valid public interest in our activities: and, most unfortunately, we often do not understand the full impact of our activities on the society in which we live and value highly.

Marshall McLuhan has stated "the medium is the message." We must certainly concede that the American communication media is having an enormous impact on the United States and the world. We believe that this impact will be beneficial in the continual process of defining the future, but the entire picture must be presented. The "good" and the "bad" side *of every facet of every* question must be examined. A prime factor in the explosiveness and abruptness of the present public environmental concern is surely poor education and communication.

Basic facts, such as the relationship between environmental pollution control measures and their effect on the cost of consumer items and world trade, must be presented to the public. On the other hand, the long-term cultural or environmental deterioration resulting from increased per capita consumption of resources, increased industrial technology, increased population, and an incomplete system for defining and comparing market values with non-market values must be presented to government, business and the public. Further, and this is the most critical, we must all be aware of what this environmental deterioration is doing to us and future generations.

Groups, usually independent and non-profit, such as the Sierra Club or the Conservation Foundation, have performed invaluable service to the world by dramatizing the values we are losing through ecologic alteration. However, they understandably have often presented only one side of the picture, just as industry often presents only its side.

We hope that HR 14753, when enacted, will serve to fill in the many communication gaps and tie together all of the diverse facts relative to environmental quality and resource use. We hope that the Act will serve to educate the public, government *and* industry on current environmental problems, ecologic relationships and man's independence on those relationships. Toward this end we have a few suggestions outlined on an attachment, which I will review for you briefly.

[Attachment]

TESTIMONY OF BOISE CASCADE CORPORATION

(By H. Tom Davis)

I suggest adding the following to the Bill:

Under Section 3(1).—A series of projects to develop textbooks and other educational reference and informative material related to ecology and environment in at least the following subjects:

Concepts in environmental planning and value assignment.

U.S. environmental post audit (a summary of environmental cause-effect relationships for a representative selection of cases).

Environment and public policy.

Basic ecology.

Human environmental interrelationships and ecology.

A compendium of environmental management concepts.

Business decision making and the environment).

Pollution: Causes and effects.

Environmental Warning Newsletter (by State, summarized nationally, published by private non-profit environmetal group).

Environment and Industry Newsletter (to inform industry of the current research and concepts pertinent to environment and its relation to business activity and current pollution conditions.)

Environment and Government Newsletter (to inform governmental agencies of current technical and conceptual information pertinent to environment as it relates to government).

Environmental Newsletter for grade schools.

Environmental Newsletter for high schools.

Environmental Newsletter for colleges.

I suggest developing some of the basic publications at three levels of education (grade school, high school and college) and revising all publications at least every three years.

Under Section 3(1).—I suggest providing funding for project(s) to develop environmental monitoring networks and pollution indices with the purpose of public information; to be published on a regular basis by news media and newletters.

I suggest under Section 5(a).—That you consider setting the Advisory Committee at five members composed of educators and persons in the communication media. (This would make the Advisory Committee more of a working committee and less of an honorarium. Twenty-one members may be unworkable.)

Under Section 5.—I feel that the purpose of the Bill could be amplified by specifying that the Commissioner set up technical advisory committees composed of not more than eight (8) experts each in the disciplines of:

1. environmental and the ecology of man
2. air pollution
3. water pollution
4. land use and environment
5. industrial pollution abatement
6. environmental education of the public
7. environmental education of industry
8. environmental education of government
9. environmental monitoring and communication
10. environment and public policy
11. world environment and resources overview

These committees should be administered on a technical fact-finding basis. The findings should be published at least semiannually and coordinated with the publishing of the newsletters.

I suggest that you consider funding scholarships and research programs at the undergraduate and graduate levels to develop environmental specialists in education and journalism. A major problem today is the scarcity of these people.

I suggest that you consider accelerated funding of local independent environmental groups in each state to develop and disseminate environmental information concerning existing and proposed resource planning, proposed development, industrial activities, existing and required educational programs, an inventory of environmental resources, and pollution. In the past this has been totally underfinanced with little or no professional staff backing.

There may develop some confusion concerning the functional relationships between the "Commissioner of Education," the "Chairman of the Advisory Committee on Environmental Quality Education" and the "Secretary of Health, Education, and Welfare." I suggest that this be clarified with only one person acting as chief administrator and that funds be provided through this Bill to allow him a professional staff.

TESTIMONY PREPARED BY GEORGE A. EK, JR., CONSULTANT, HISTORY AND SOCIAL STUDIES, COLORADO DEPARTMENT OF EDUCATION

(Affiliation is shown for the purpose of identification only and does not imply support of the organization named. The views expressed within this testimony, and those expressed in the cited analysis are not necessarily the views either of the Colorado Department of Education or the Colorado State Board of Education)

No person contacted or consulted responded negatively to this legislation. The range of favorable opinion varied from wholehearted total subscription to qualified acceptance. Several made suggestions as to possible changes within the proposed law.

FUNDING

Without the legislative enactments and the economic support, there is no more assurance of education's involvement in ecological matters than there is for a halting of environmental deterioration by business, industry or commerce. As pointed out in the analysis,

* * * Although legislation such as this is so encouraging, the degree of environmental deterioration may have descended to such a depth that too little too late will not change the impairment. The funding should be a manifestation of the long-range environmental quality education plans and objectives and reflect, too, the impact that other activities of environmental improvement programs, as sponsored by the executive and legislative branches of the government, may have.

LIFE COMES FIRST

* * * Education, in the broadest meaning, has a monstrous obligation that centers upon its first responsibility of educators: To Assure That the Life and Safety of Each Child Comes First. The second responsibility may well be the greatest possible life quality—which in an ecological framework cannot be separated from the total web of all life.

With those goals of life, safety, and quality, the following has been prepared to illustrate the need and the opportunity served to education.

AN OVERVIEW

The three "E's"—Ecology, Environment, and Education—combine to help realize the quality of life on earth that this legislation by title obviously longs to achieve. The three parts of this testimony focuses upon this same objective.

The first is a brief summary of an analysis sent to Congress. The analysis also serves as a bridge within this testimony which connects the entitled parts. "The Education's Summons" examines the threat and the challenges faced by this country as well as the world community. Also identified are those aspects which if acted upon by education could provide a greater opportunity to realize that state of desired quality. The third part stresses the essence from which the positive, wholesome change envisioned by this legislation must rise. It speaks to basic issues and penetrates into the realm of man's capacity to be human and especially what deep, internal changes man must undergo inside of himself in order to extend his human qualities.

The Analysis

The Select Subcommittee on Education was furnished an analysis of the Environmental Quality Education Act in early March, 1970. The Board and staff of the Colorado Department of Education, members of two statewide committees of the Department, and selected individuals of various organizations were distributed a copy of House Bill 14753. They were requested to examine, correct, and criticize the proposed legislation.

EDUCATION'S SUMMONS: A CALL TO CONTRIBUTE TO THE QUALITY OF LIFE ON EARTH

The Threat

The threat to our environment and to what has been termed "Spaceship Earth" has such dangerous possible consequences that its seriousness pales all other issues. Its overwhelming gravity and prodigious implications envelop the current problems man faces. Further, by addressing our efforts to the deteriorating environment, the other problems ironically need not be neglected but become a part of joint endeavors to assure survival and achieve a quality environment.

We must recognize that the efforts may be every bit as draining as the Gargantuan struggle expended by all belligerants during World War II. The resolution submitted by the youth present at the concluding session of the Thirteenth National Conference of UNESCO at San Francisco captures the condition, to wit: We, having concluded that the species homo sapiens is in a crisis situation, ask the United Nations and President Nixon to declare a state of international environmental emergency.

YOUTH SPEAKS OUT

Youth is obviously going to speak to the problems of pollution and population control in very strong terms, followed by what could be disrupting, violent action. As Penfield Jensen, graduate student, San Francisco State College, wrote in the

Background Book for the "Man and His Environment . . . A view Toward Survival" UNESCO Conference, and which Arthur Godfrey fervently quoted in his presentation before the Second General Session:

"The naivete, enthusiasm, and idealism of young people is not a thing to be scorned, for it is the raw material of constructive growth * * * we will stop the destruction of this planet even at the cost of our futures, careers, and blood. The situation is simply like that—if you are not going to live for the Earth, what are you going to live for?"

The question could hardly be more clearly posed.

The heat of the statement that "* * * we will stop the destruction of this planet even at the cost of our futures, careers, and blood." has smoldered in the issues surrounding environmental deterioration. Since to assure that the life and safety of each child comes first, what more basic plea could be made for education's involvement in environmental matters?

A CATACLYSM TO JAR THE NATION

A cataclysm, too, could jar the nation, and education with it, into developing the bulwarks necessary to halt additional environmental and ecological disasters. How important the schools were during World War II in serving for draft registration, food rationing, war information, and civil defense. A half million Los Angeleans buried en masse by graves registration teams, following a future smog inversion, is the type of incentive for environmental awareness and meaningful action that human consideration and applied wisdom could avoid.

DuBridge's Three Challenges

So much for the grim and relevant. Dr. Lee A. DuBridge, science advisor to the President, at the UNESCO San Francisco conference, pointed out in the keynote address that we face three challenges. The headings are my own.

Harmful to Harmless: To adopt procedures to ensure that harmful waste products that are produced are converted to harmless forms before they are discharged back into the environment. Thus, dangerous bacteria, obnoxious or poisonous chemicals, etc., must be removed at the source.

Disposal without Defacement: Other materials—dirt, smoke, trash, junk, garbage—must be disposed of in ways that do not dirty the air or water, or deface the land.

Consideration of Consequences: Greater care must be exercised in allowing the marketing of new products—food additives, insecticides or herbicides, household chemicals or materials—to assure that they are not harmful to humans or to fish and wild life, or that there are safe and unobstrusive ways of degrading or disposing of them.

As Dr. DuBridge acknowledged, these solutions are neither cheap nor easy, and that the necessary technology is available in some cases and yet to be developed in others. The President's advisor also asserted that the responsibility must be borne by local, state and federal governments, as well as international agencies. It is self-evident to me that education will have a large role to play. How commodities are reduced from harmful to harmless, and how materials can be disposed of without defacement, particularly are questions that education can consider within the learning process. Consideration of consequences needs to be extended from the nursery and the school room into the adult and especially the economic community.

DuBridge's Aspects: Environmental Quality

Since the proposed legislation directs education explicitly to focus upon ways to achieve the greatest life quality, examination of Dr. DuBridge's aspects necessary to achieve a quality environment would seem appropriate for both those who enact environmental legislation as well as those who implement it. The headings, again, are not DuBridge's.

Regulations: Regulations must be developed and enforced to protect the public interest and must be imposed in such a way as to provide an equitable distribution of the costs involved.

Research: Research must be fostered by many agencies—private, public and international—to determine where health hazards exist and to develop technologies for safer and more considerate disposal of waste products.

Tolerances: Since absolutely pure air and pure water are unattainable in this modern world—except at prohibitive cost—research must be fostered to determine tolerance levels of various impurities—levels below which hazardous or obnoxious effects will be negligible. Zero tolerances are both unnecessary and impractical.

Education and Cost Sharing: A broad educational program must be established to inform the average citizen that his actions may degrade the environment and that he must be willing to share the costs of environmental improvement—through higher taxes or higher costs for the products he buys.

REGULATIONS

As to laws and regulations developed to protect the environment, legislative enactments will be meaningless in terms of their effect unless they are developed in the public interest. If the public is involved in the development of them—and here education could be particularly helpful in fostering the democratic process—the public will support them.

RESEARCH AND TOLERANCES

The necessary research and the establishment of tolerances certainly involves education. The universities and colleges contracted to assist in these areas will be funded under a variety of sources and by different legislation. Nonetheless, the results of research and the establishment of the tolerances will be disseminated through education for information and consideration. As this happens, the Environmental Quality Education Act will be applied.

EDUCATION AND COST SHARING

The aspects that DuBridge identifies about education and cost sharing might have been written with this legislation in mind. No one doubts that to halt environmental deterioration and to strive for a quality environment are going to cost. Education may be able to help the public intelligently enter into the act of determining how that cost is going to be defrayed with equity.

AN EDUCATIONAL COMPONENT IN RELATED LEGISLATION

Although not directly applicable to this legislation, DuBridge excites another concept that could complement the intent and purpose of the Environmental Quality Education Act, and calls upon a need to make existing and future legislation harmonius with it: the need for environmental, conservation, and other ecological efforts supported by funding, such as is available through federal and state sources, may be entirely wasted if the present and future generations are not educated to the purposes and importance of these efforts. It is as simple as this: the efforts and monies expended on the forests and parks of this Republic will be meaningless if the public fails to use them and appreciate them properly. The same applies to the sport, fisheries and wildlife, as well as other agencies and activities sharing and dedicated to similar concerns. Assuring that the investment of today yields success tomorrow constitutes a current educational need. Indeed, the educational aspect may be so all important that no environmental ecological, or conservational endeavor should be authorized without an educational component. If Congress were to be as bent upon regulating environmental concerns as they were in enacting the Eighteenth Amendment, without grass roots support and an educational component included, their noble gesture might be no more effective than was National Prohibition.

The Opportunity

The dimensions of the threat speak to all living things. But the challenges are addressed alone to mankind. How, and to what degree we accept and act upon the aspects identified by the President's advisor may determine the quality of our environment. Education, in the broadest meaning of the word, has the capacity and opportunity—with the help of legislative action and funding—to tip the balance between extinction and survival and, simultaneously, to add the weight of quality to life on Earth.

The Analysis submitted to the Select Subcommittee emphasized values. When education answers the call to contribute to the quality of life on Earth, a great deal will depend upon what basis education will use to develop its plans, programs, materials, and operations.

> Ultimately, what we do with our environment and what we do with each other hinges upon our values and our value system. The economic, political, and social forces in a value system determine how we use our science and technology. Although carried out by the business and industrial community, the nursery of these use concepts of man and environment is education.

> Therefore, the monies necessary to stem all manner and form of pollution must be matched by equally imaginative, unselfish, and vigorous efforts in in education.

The following builds upon the concept that "* * * Ultimately, what we do with our environment and what we do with each other hinges upon our values and our value system * * *," and is submitted for inclusion in the Hearing Record as a rationale for the Environmental Quality Education Act, and for consideration in the development of subsequent legislation.

THE QUALITY OF LIFE ON EARTH: AN ASPIRATION ATTAINABLE ONLY BY APPLICATION OF VALUES AND ETHICS

The Web of Life

The essence of this planet's ecological and environmental challenge to which the people, the Congress, and the schools are summoned was described in 1953 by John Storer in his book, *The Web of Life*. He wrote of man:

* * * He has achieved almost unlimited power to multiply his number and at the same time to destroy the world's resources that might have supported him.

This web that is the inter-relationship of all living things to one another inextricably interweaves man with all life. That that web of life is threatened, and that we have an opportunity to do something effective about it in our time, constitutes our responsibility and opportunity.

MAN AND ALL LIVING THINGS

Fairfield Osborn of the Conservation Foundation, defines in the introduction of Storer's book, The Web of Life, what he felt that web was. For us to meet the responsibility and do something about it, it may be helpful to understand what Osborn wrote:

> The youngster, captive on the sidewalks of our big cities, the farmer struggling in a dust bowl, the sullen river that once ran silver, the desolate tangles of second growth, even the last condor on a California mountainside—all have a tremendous relationship to life and this earth as a whole. Man does not stand alone.

Note that "* * * Man does not stand alone." refers not to man's relationship singularly with other men but his relationship to all living things. The center of his points of view are not the total species of man, a culture of man, nor even the individual man himself. Application of this thinking negates the building of centrifical forces which heighten the ego of the species, of the nation-state, of the culture, or of the given individual. The challenge that Storer issues to us probably is best expressed in Storer's own words:

> Under the domination of his intellect, the world's life, and the environment of that life, seem to have reached a crossroads, and the choice of direction is for the future to decide.
>
> The great and deciding test, however, still remains—whether man can coordinate knowledge into understanding and build within his heart the incentives and the wisdom to use these newfound powers wisely, and with responsibility, for the common good.

The Crux Buried in Values

The crux of the issue is buried in the value system upon which this nation and we in it function. Ultimately, a value system determines how people think and how people operate. What considerations people focus upon, and what people then do in terms of action, spell out either destruction or survival.

THE AMPUTATED ROOTS

The issue of continuation of life itself on earth has to begin with what beliefs people hold, what attitudes they develop, and how they convert these into action. Lynn White, Jr., in his essay "The Historical Roots of Our Ecological Crisis," which appeared in the March 10, 1967, issue of *Science* magazine, spoke to his issue, as follows:

> What we do about ecology depends upon our ideas of the man-nature relationship. More science and more technology are not going to get us out of the present ecologic crisis until we find a new religion, or rethink our old one. * * * Possibly we should ponder the greatest radical in Christian history

> since Christ: Saint Francis of Assisi. The key to an understanding of Francis is his belief in the virtue of humility—not merely for the individual but for man as a species. Francis tried to depose man from his monarchy over creation and set up a democracy of all God's creatures. With him the ant is no longer simply a homily for the lazy, flames a sign of the thrust of the soul toward union with God; now they are Brother Ant and Sister Fire, praising the Creator in their own ways as Brother Man does in his.
>
> * * * Saint Francis, proposed what he thought was an alternative Christian view of nature and man's relation to it: he tried to substitute the idea of the equality of all creatures, including man, for the idea of man's limitless rule of creation. He failed * * *
>
> * * * the present increasing disruption of the global environment is the product of a dynamic technology and science which were originating in the Western medieval world against which Saint Francis was rebelling in so original a way. Their growth cannot be understood historically apart from distinctive attitudes toward nature which are deeply grounded in Christian dogma.

THE LAND ETHIC

Although the re-evaluation of our current value system and ecological relationship may be nurtured in the historical roots planted by men like Francis an ethic has been developed for us by two of our contemporaries. That evaluation, can begin with Aldo Leopold, who bequeathed to each of us a land ethic. "The Land Ethic" was assembled with other writings by Leopold in *A Sand County Almanac* and published by Oxford Press in 1949. He held that man has continually and sequentially extended his ethical considerations. He cites how men like Odysseus, returning from the Trojan Wars, executed his dozen slave girls all on the same rope for suspected misbehavior. The Roman father, like others in the ancient world, had power of life and death over his own children. This power was removed from his hands, and much later ethical considerations were extended to the life of human chattel as well. The long, sorrowful human trail that lead from manumission, and ultimately to the physical abolition of slavery, lies smeared within the trail's ruts—as a vivid witness to the sequential extension of ethical considerations. As Aldo Leopold points out:

> There is as yet no ethic dealing with man's relation to land and to the animals and plants which grow upon it. Land, like Odysseus' slave-girls, is still property. The land relation is still strictly economic, entailing privileges but not obligations.

The Right to Life Extended

Aldo Leopold saw the extension of moral principles and values from people to land as a necessity. It was inconceivable to him that an ethical relationship to land could exist without love, respect, and admiration for the land. The land to him was the biotic community—the community that constituted what Storer was to call the "web of life." To Aldo Leopold, the other members of life's community also have rights.

> * * * birds should continue as a matter of biotic right, regardless of the presence or absence of economic advantage to us.
>
> * * * predators are members of the community, and that no special interest has the right to exterminate them for the sake of a benefit, real or fancied, to itself.

The extension of the ethic to land—the web of life—affirms the right to continued existence, and even the continued existence as best could be managed in a natural state. He summed it up, thus:

> In short, a land ethic changes the role of Homo sapiens from conqueror of the land-community to plain member and citizens of it. It implies respect for his fellow-members, and also respect for the community as such.

Ethical and Esthetic Considerations

Acceptance of the land ethic brings about reconsideration of economic factors. Leopold maintained that the "key log" in our own perceptions that had to be moved was to "* * * quit thinking about decent land-use as solely an economic problem." Two other factors deserve equal consideration. Leopold felt that each question as to what constitutes decent land-use should be examined "* * * in terms of what is ethically and esthetically right, as well as to what is economically expedient."

Since we reap the harvest of little or no attention having been given to ethical and esthetic consideration of land-use, is it possible that more than equal consideration should be given to these factors? Why do we stand mute and not challenge the demand that valid evidence has to be expressed in economic terms?

THE STARK COMMENTARY

As Leopold points out, "* * * When one of these non-economic categories is threatened (songbirds are the example he uses), and if we happen to love it, we invent subterfuges to give it economic importance." At the beginning of this Century, extermination of songbirds seemed likely; therefore, a campaign was mounted by ornithologists and others to save them. Justification for halting their slaughter was not based upon the genuine concern and love for the songbirds, but upon an extension and exaggeration of their economic worth. The subterfuge was so internalized that the defenders convinced themselves and others that without the songbirds insects would devour the earth.

It is a stark commentary upon Western ethics when we reject—or worse, destroy—that which we love for economic gain. Fooling ourselves into transmitting genuine ethical and esthetic factors into economic terms, doesn't flatter our humanity either. How tragic, too, for all other members of the biotic community when only arguments of economic worth are voiced and heard.

"Reverence for Life"

The ethical and economic melodies harmonize with Schweitzer's "Reverence for Life." Indeed, the two are so much in accord, that the mind may blend them. It was Leopold, but it could have been Schweitzer, who wrote:

> One basic weakness in a conservation system based wholly on economic motives is that most members of the land community have no economic value.

A "Co-extension with Education"

In order for man to extend his social conscience to embrace a land ethic consisting of all that is in the community—soils, waters, plants, and animals, deep internal change is needed of all of us. Our intellectual emphasis, our loyalties, our affections, our convictions, must be recomposed to be in harmony with all living things. This recomposition requires an ecological comprehension of the land which in turn implies an understanding of ecology. To obtain that understanding of ecology means that ecology has to be a living, dynamic part of education. Leopold maintained that the understanding of the ecology means a "co-extension with education."

STATEMENT BY ELLA F. FILIPPONE, ECONOMIST, BASKING RIDGE, NEW JERSEY

The quality of life is dependent, I believe, on the quality of the environment and the quality of education equally interrelated. Environmental education in all areas of the school system from K through college is imperative if Man is to survive. We cannot continue to pollute our air, water, and land. We must find a solution to many of these problems. It would seem that since Man has through his experiments and productiveness been able to build and destroy, he should also be able to take those wastes which he manufactures and find ways and means in which to break them down to complete the cycle, so that he can use them in a productive process again. This cannot be quickly accomplished, however, unless more people begin to form a new attitude toward themselves and their environment and then begin to ask for these changes from industry and government.

I am sure that you have received a great deal of testimony on the need for environmental education for our young people and especially those children in the cities and our ghetto areas. I am not going to dwell on this need, although it is extremely important. I would like to go on record, however, that this should be one of the primary considerations of the Environmental Quality Education Act.

As an economist, I often find that individuals view their environment as the out-of-doors—nature. This is not totally so. The homes in which we live, the place of work—factory, office, school, farm, transportation—all are an important part of our environment. This new concept of environmental education must do more than give people a renewed appreciation for their natural environment. It must make them more aware of what really constitutes a better life—it must change their values. People, for example, must begin to understand the need for open spaces and the importance of a swamp's ability to retain water for their own water supply. They must begin to understand that it is far more expensive to buy a cheap house in a flood plain than it is to buy a more expensive house on dry land.

It is extremely important that those theories and attitudes relevant to improving our environmental problems begin to be established during this generation. I was astonished at the lack of understanding among members of the academic community during various Earth Day seminars I attended as to the effect pollution has on the overall growth structure of our economy. We must take some of these people out of this sterile-theoretical atmosphere and place them in the real problematical world in which many of the theories with all their conflicting variables do not work. The cost factor of air pollution alone can hardly be estimated; it changes every day, since we find it damages another part of our economy daily. If we could isolate one element and place a cost factor on it, we would come up with astronomical figure in dollar and cents. We do not know how air pollutants actually effect the health of our Nation; we do not know how it effects the growth of our crops; we can only speculate. When one questions the expert engineers and technicians, one finds that answers might be found in the future. We must begin to find solutions. This can only be done through research, and we must encourage students to go into these fields. We must give every incentive to those interested in finding solutions to this multifaceted crisis.

In our concern with the problem of controlling environmental pollution, we will engender problems of economic stabilization. It is possible that these stabilization problems will arise because at the present time we have not established appropriate measurement concepts and thereby resultant statistics.

For example, as industry begins to spend more for pollution controls, their outlays will naturally be absorbed in the rising costs of their products or services. Therefore, price statistics will show an upward trend. Another alternative would be if government assumed some of the costs via the route of tax credits or other incentive measures. Then the curve would not be as high in the private sector. In any case, to conclude that we will have an economic stabilization problem because prices are rising is somewhat incorrect. New benefits will have been created, some of which in the long run will increase the total productivity in the economy. One must begin to include the social benefit derived from the inclusion of pollution abatement processes towards our environment. The costs and prices of the intial outlay will, of course be high; however, the ultimate result in stopping the deteriorating environment and reversing the trend will pay after a period of time has elapsed. This example is but one theory which must be reworked in order to put our economic house in order. We must develop a new subject which I call "environmental economics," which in brief is the study of the marketplace with all of its interrelated ecological problems included. The businessman should also be one of the participants of the environmental education program, as I believe our economy is just beginning to see some of the financial problems it will experience if we do not change our approach.

New Jersey, as my home state, has always held a special interest for me. It is the most densely populated state in the Union; heavily urbanized, and one of the most industrialized states in the country. We have all the problems of pollution in emergency categories. The projections are not very encouraging unless we begin to rectify them now. Our State government has reorganized the structure of our state departments with the establishment of the Department of Environmental Protection.

Through the farsightedness of Assemblywoman Josephine Margetts, a bill was introduced and ultimately passed, providing for the establishment of Conservation Commissions in municipalities desiring to do so. To date, 70 have been established throughout New Jersey.

Rutgers University, with the assistance of a grant from the Ford Foundation, presented a Course for Conservation Commissioners. It was held in three areas of the State, i.e., Lincroft, N.J., New Brunswick, N.J., and Morristown, N.J. The course was oversubscribed to, and as a participant of the Course, this was an excellent introduction for approximately 100 adults in the State to start to see the gravity of the problems facing them. Many fortunately were in decisionmaking positions in communities so that once they returned home, they could continue their studies of problems of particular concern to them and apply them in the proper direction.

In Bernards Township, we not only have established a Conservation Commission (four of the six commissioners took the Rutgers Course), but we also have an organized group of Citizens for Conservation—Bernards Township, of which I am a director and publicity chairman. We have a membership of over 100 families within the Township and have participated in numerous educational programs not only in our own Township but in neighboring communities as well. We have been instrumental in starting other Citizen's groups as well as the formation of new Conservation Commissions in other communities. It is one of the only service organizations which works around-the-clock with volunteers from all walks of life with all kinds of talents from young and old.

The Somerset County Park Commission is in the process of building an Environmental Education Center in Lord Sterling Park, Bernards Township. Once this is established it will assist in the formulation of curriculum and the training of thousands of people in environmental education. This Center will not just be a nature center, but will show how Man is dependent on all of this surroundings and how he must take care of these surroundings so that he will be able to continue to survive.

A bill has just been introduced in the New Jersey Assembly, Bill No. 1092 by Assemblywoman Margetts, Assemblymen Ewing, Kean, Pfaltz, McDonough, Kiehn, Fay and Florio, "An Act providing for the promotion, establishment, and operation of local school district environmental education programs, the establishment and operation of a network of Regional Environmental Education Facilities and Centers for the purpose of providing environmental education programs for public and private school students and teachers, for the establishment and operation of a network of Environmental Education Curriculum Research and Development Centers, and making an appropriation."

With participation on a local level as well as state and federal, it might be possible to turn the tide. Education has proved itself many times over. It was through increased knowledge that Man has developed from the cave to the abundance of life we enjoy today. We have proved many times over that the more education an individual has the better place he can make for himself in society. It would seem to me that environmental education interwoven with all other subjects would reap limitless rewards. It would bring a better understanding of not only Man's relationship with the natural environment but with his brother Man on which he is also dependent. He will begin to comprehend better that ghetto's bring decay which ultimately spread; that what is needed is an understanding of the delicacy of balance in nature, such as our relationship with the micro-organisms in the soil and how pesticides are destroying our chances of any relationship at all.

The "luxury of polluting" must be eliminated from our society. Archeologists have shown that the demise of many great cities was caused by water pollution or the loss of water supply altogether. Scientists of today are constantly warning of the possible problems which might arise from "bad" water. Education of our masses is the only solution. We must begin NOW!

I strongly endorse the passage of the Environmental Quality Education Act of 1970.

STATEMENT SUBMITTED BY PAUL A. FISCHER, DIRECTOR OF FEDERAL PROGRAMS, KENAI PENINSULA BOROUGH SCHOOL DISTRICT, BOX 539, KENAI, ALASKA

A PLEA FOR PASSAGE OF H.R. 14753

There is no need to elaborate on the importance and relevancy of H.R. 14753 and H.R. 15934 which will be recorded in time as one of the most significant pieces of legislation since the establishing of our country.

Several months ago (prior to the introduction of H.R. 14753) the Kenai Peninsula Borough School District developed an Environmental Quality Education Program working with the total community including: Kenai Peninsula Community College of the University of Alaska, Community Action Committee, United States Department of the Interior—Fish and Wildlife Service, State of Alaska—Department of Natural Resources, State of Alaska—Department of Fish and Game, United States Department of Agriculture—Soil Conservation Service, and the United States Department of the Interior—Bureau of Land Management. This program has also received support from local citizens, industry, city governments, various conservation societies, and outdoor clubs.

We titled this program "A Year Round Laboratory Approach to Environmental Education." This program was submitted to the Alaska State Department of Education to be funded under Title III, E.S.E.A. We have just finalized our budget negotiations. It will be funded and is scheduled to be initiated on June 1, 1970.

General Objectives of this program are:

1. To develop an integrated curriculum (environmental education with all academic disciplines) K–12–Adult.
2. To provide inservice training programs on environmental quality and ecology.
3. To develop Environmental Instructional Materials dealing with the environment and ecology.

Specific objectives of this program are:

1. To develop an awareness on the part of each individual of how his environment is affected by natural processes.
2. To develop an awareness on the partl of how of each individua man can control his environment.
3. To develop in each individual a recognition that he and all mankind as well benefits through "wise use" of a particular segment of his environment.
4. To develop in each individual positive attitudes in his relationships with, and treatment of his environment.
5. To develop in each individual his own environmental code of ethics.

A team consisting of a university representative, a resource person from the United States Forest Service (also a school board member), and myself representing the local school district set out to evaluate several Environmental Education programs in various states primarily in order to:

1. determine their effectiveness in educating the public
2. determine the weak features and mistakes as well as the strong points
3. determine the feasibility of establishing National Environmental Studies Centers which would be of extreme value to teachers from all areas of the United States
4. open a line of communications which would hopefully lead to the establishing of an Environmental Quality Education Information and Materials Clearinghouse
5. determine the similarities and differences between the evaluated programs
6. determine the funding level compared with the objectives of the program.

I would like to share with you the conclusions of our evaluation especially since they are related to the operation of H.R. 14753 and H.R. 15934.

1. There must be acceptance of a community responsibility and the development of public understanding of the nature of the environmental problems we face.
2. Environmental Quality Education Programs must begin at the grass root level—elementary and secondary.
3. To be effective, Environmental Quality Education Programs must have total community cooperation—Local, State, Federal.
4. Environmental Quality Education Program must insure active participation of individuals and organizations and *not* merely a "sign off" as is the case of many E.S.E.A. programs.
5. There must be sufficient funding to do the job—not token money.
6. Some Environmental Quality Education Pilot Programs should be funded directly from the U.S.O.E. for a period of several years.
7. At least two pilot National Environmental Quality Education Studies Centers charged with preservice and inservice teacher training should be established—one located in an urban environment and one located in a rural environment.
8. There should be established in each state a clearinghouse for an Environmental Quality Education Information and Instructional Materials Cleaninghouse.
9. There should be established a National Clearinghouse for Environmental Quality Education Information and Instructional Materials.
10. Environmental Quality Education programs must place emphasis on an integrated curriculum rather than the development of an ecology course. Environmental Education is reading, writing, arithmetic, art, social studies, science, math, music, conservation, outdoor education, ecology, social science, vocational education, dropout prevention, special education, etc., etc.
11. Environmental Quality Education programs must allow for innovation.
12. Environmental Quality Education curriculum must be relevant to the ages and interests of the students. A high level of ecological sophistication should not be shought at the expense of educating citizens about environmental quality and ecological balance.
13. The United States Commissioner of Education should consider appointments to the Advisory Committee on Environmental Quality Education, established with the passage of this bill, to include persons "tuned in" with elementary

and secondary education such as elementary and secondary teachers and administrators. We in elementary and secondary education do want a piece of the action—we want to be involved!

14. The Environmental Quality Education Act must become law!

There are some obvious dangers with the passage of this proposed bill:

1. There may not be enough funds to do the job.

a. If funds are given directly to the states it may be spread too thin by the State Departments of Education resulting in every school doing something and no, if any, school doing an in-depth program.

b. The appropriations must be realistic and not token money.

2. It may lead to adding on teaching units with only the up-to-date label of environmental and ecological education.

3. It may lead to false hopes. Environmental ills won't be cured over night. It will take time.

4. Environmental Quality Education may end up as "research" programs without application.

The Kenai Peninsula Borough School District believes that we can only maintain a habitable environment if our citizens realize what is at stake. When students through education see the land as a community to which we all belong, they will learn to value, love, and respect it. There is no other way for land, water, and air to survive the impact of civilization and our mechanized culture.

We in Alaska, along with the rest of the United States, are trying to undo much of the damage already done the environment. We in the Kenai Peninsula Borough School District through "A Year Round Laboratory Approach to Environmental Education" are attempting also to do the opposite—teach and demonstrate how to protect the environment before the damage is done through a wise use of our environment.

Public concern for Quality Environment is growing in leaps and bounds. Within a period of three weeks 20% of our school district's teachers have applied for admittance into our summer teacher inservice Environmental Education Program. Over 50% of the districts in the State of Alaska have requested participation. The Bureau of Indian Affairs has also indicated a desire to participate. Educators from the States of California, Florida, New Mexico, Pennsylvania, Maine, Illinois, Oregon, and Maryland have indicated that the Kenai Peninsula Borough School District's Program can be successfully adapted to any state regardless of geographic location.

Because of such public concern nationwide, the Federal government must come to the aid of local educational agencies such as the Kenai Peninsula Borough School District whose current ADA expenditures of $1200/student is already over twice the national average ADA expenditures.

Our district has an ecological advantage envied by each of the environmental education programs visited by our team discussed earlier. Through cooperation with the United States Department of Agriculture, United States Department of the Interior, the Alaska Department of Natural Resources, and the Alaska Department of Fish and Game, we have the natural ecological facilities of marine, fresh water, forest, and mountain all within walking distances of an Environmental Quality Education Studies Center. Resource persons from all of these agencies are available to the program.

The Kenai Peninsula Borough School District would like to share our program with teachers from throughout the United States as well as Alaska but present Title III, E.S.E.A. funding makes it impossible.

We urge the passage of this bill; and through this act we are confident we can share our program with educators from throughout the nation, who along with Alaskans own the federal lands which are available to the "Year Round Laboratory Approach to Environmental Education" located within the Kenai Peninsula Borough.

Americans have the right to a clean environment, which can only come to be, through the overcoming of our ignorance.

The Role of Education in our Environmental Crisis

(By J. D. Hare, M.D., Associate Professor of Microbiology, University of Rochester School of Medicine and Dentistry, Rochester, N.Y.)

The rate at which mankind is busily destroying the world's environment is not offset by a comparable increase in man's awareness, interest, or alarm in this crisis. Many governments and the U.N. have begun to heed the warning signals. However, the factor which impedes progress is the lack of concern on the part of each and every human who must by his own labor provide the staggering monies required to reverse the tide of destruction. Therefore, the problem can be reduced to one involving ways in which to motivate the mass of humanity to take immediate steps designed to preserve the Earth's environment.

Two approaches are possible. One is by decree, but this requires a level of totalitarianism impossible to achieve and to be avoided at all costs. The second is thru a crash program of education in Environmental Science. The goals of this educational program are two-fold. In the first place, control of environmental destruction cannot be attained unless control of human population expansion is instituted immediately. Thus, a world-wide educational effort must be mounted to establish new attitudes, goals, and priorities related to human reproduction.

The second goal of this program is to provide the world with individuals trained at all levels of environmental science. This should include research scientists, college and high school teachers and technicians of various types to staff the facilities made available on a regional and world wide basis.

Mankind must be oriented to the concept that the Earth's resources are not infinite, that the existence of Man on Earth is dependent on the environment and that Man is an integral part of the Earth's ecosystem. This orientation should begin during elementary educational experience throughout the world. Fragmentary, piecemeal attempts are not adequate.

The experience gained from observing the interest and enthusiasm shown by a group of high school students from the "Inner city" of Rochester, N.Y. working on problems of the recognition, prevention and control of lead poisoning has convinced me that a solution to our dilemma is possible. The establishment of educational programs properly oriented and with their "relevance" to the hard facts of "life" clearly spelled out by competent persons provides the one feasible method of reaching the bulk of mankind within the next generation with solutions to the most pressing and challenging problem faced by modern man. The failure to initiate a massive educational effort aimed at the control of both population and environmental destruction at this time may well spell the decline of this Planet as the home base of *Homo sapiens.*

IDAHO ENVIRONMENTAL COUNCIL,
Moscow, Idaho, June 9, 1970.

Hon. ORVAL HANSEN,
House Office Building,
Washington, D.C.

DEAR MR. HANSEN: The Idaho Environmental Council supports the "Environmental Quality Education Act", H.R. 14753, and commends Idaho Congressman Orval Hansen for co-sponsoring this important legislation, which would "authorize the United States Commissioner of Education to establish educational programs to encourage understanding of policies and support of activities designed to enhance environmental quality and maintain ecological balance."

Certainly, ecological ignorance is at the root of many of our country's environmental problems. We pollute, waste resources, and destroy open space unnecessarily, not so much because of calculated selfishness, but primarily because we do not realize the implications of our individual actions. We have a long tradition of exploitation with little regard as to consequences; of "conquering nature", somer how with the mistaken assumption that our species is not a part of that nature-but is immune to the laws of nature. These attitudes must be changed soon, o, the environmental crisis will grow even more acute. The emphasis must be shifted from development to protection. Regarding H.R. 14753, the Idaho Environmental Council makes the following comments:

1. Hopefully, adequate funds will be allocated to make this act mean more than the usual political rhetoric about environment; say on the order of 0.1% of, or even 1.0% of our total military budget.

2. These funds should be used strictly for educational institutions and for non-profit environmental and educational organizations and agencies which have no vested economic interest in exploitation of material resources. We feel also that government agencies oriented toward development should not receive grants, but those oriented toward protection should. Respective examples are the Bureau of Reclamation and the National Park Service.

3. We would hope that many educational, non-profit, conservation organizations such as ours will qualify for grants. The Idaho Environmental Council believes that we can use to good advantage for the environment of Idaho $60,000

to $80,000 per year, and we look forward to supplying, at the appropriate time, a detailed application for, say, a 5 year period.

As a nation, we need to develop a better land ethic. One of America's greatest ecologists, Aldo Leopold, once said that we must learn to look on land not as a commodity, but as a community to which we all belong. The Environmental Quality Education Act could help us to develop that land ethic.

Sincerely,

GERALD A. JAYNE,
President, IEC.

TESTIMONY PRESENTED BY AD HOC COMMITTEE ON ENVIRONMENTAL EDUCATION AT IDAHO STATE UNIVERSITY, POCATELLO, IDAHO

THE IMPORTANCE OF A MULTIDISCIPLINE APPROVAL IN ENVIRONMENTAL STUDIES

Studies pertaining to the environment of mankind are complex, for they involve not only the interactions of the biological and physical environments, but the sociological, economic and political aspects as well. Therefore, in the training of students hopefully to contribute to the solution of environmental problems, there is a need for not only the specialists in the various disciplines, but students trained with a far more general background than is possible within the limits of present curricula.

It can be very well established, biologically, that the greatest threat to the future of mankind lies in the alarming growth in numbers of people. Although it is important to control pollution and destruction of the environment, any gains made in this area would soon be lost if the population is allowed to increase unchecked. Thus the study of population biology is indispensable. Other related fields that should be studied in conjunction with population studies and which pertain to the *total* environment, are:

1. Studies of the interactions between plants and animals with the aquatic, soil and air environments, as well as the interactions of animals to animals, animals to plants, and plants to plants need to be continued. Any future planning done without this kind of knowledge would be done without a solid foundation.
2. Environmental geology is often critical in the building of any structure. It is important in building reservoirs and protecting our ground water resources and in exploration to find and to intelligently use our natural resources.
3. Chemistry and physics are essential, not only in geology but in all other scientific studies of the environment.
4. Archaeology and Paleontology are essential in understanding the present environment by revealing the histories of past environments. Such studies pertaining to extinctions of human cultures and animals contribute to this understanding, especially since excavations are, in effect, "natural laboratories".
5. The rapid dwindling of our natural resources all over the world points to the necessity of not only working out means of "recycling" available resources such as steel, aluminum, etc., but with our ever-growing population, plans for a future economy which will probably be curtailed, are vital.
6. Studies of sociological and political problems involving the implementation of plans and programs relating to reduction in population growth and environmental improvement are not merely a necessity but a matter of survival for our species.

It seems at least desirable, therefore, that highly intelligent students be educated very broadly and should have the intellectual capacity which would permit a synthesis or the tieing together of the information learned from the various disciplines listed above, since many future political and social decisions will inescapably be based on a broad spectrum of integrated knowledge.

(Testimony by John A. White Curator in Vertebrate Paleontology Professor of Biology.)

AWARENESS AND COLLECTIVE ACTION

On *Earth Day*, April 22, 1970, thousands of Americans spoke out on a complex of problems threatening the existence of life everywhere on earth. They pointed to a large body of substantiated facts and drew fully warranted conclusions: The World's resources, and modern industrial production and consumption is using up these resources at an ever accelerating rate and poisoning the very water and air that supports all living matter in the process. Millions heard or read about what these concerned Americans had to say, but did they really understand what was being said? Are they now aware of the problems? And if they are aware, will they choose to act to solve these problems?

I don't believe that we can honestly answer these questions at this time, except, perhaps, to say that we don't know. We seem to have a blind faith in technology—that technology will solve all of our problems—but it is human beings who are involved and it is human beings who must give direction to technology. This, it seems to me, requires knowing a great deal more about ourselves, our values, our way of life than we do now. To survive we must know ourselves! When and how will we choose to do that nationally?

(Testimony by B. Robert Butler, Curator of Archaeology, Assistant Professor of Anthropology.)

OUR LIMITED NATURAL RESOURCES—A PHILOSOPHY FOR DEVELOPMENT AND USE

"We are determined that the decade of the seventies will be known as the time when this country regained a productive harmony between man and nature"; so stated President Nixon in a recent New Year's Day speech. On the surface, at least, this appears to be a worthy objective, but from a natural resource point of view it is one based on a false premise. Since the beginning, man has been at war with nature. He has constantly increased his potential for the destruction of his natural surroundings and for misuse of resources. We cannot regain what is no longer available, and certainly we cannot regain what we never had—an unlimited, inexhaustable supply of material and energy resources. But we can and must *begin* in our attempts to *gain* harmony with nature.

In 1966, Sir MacFarlane Burnet, as a Boyer Lecturer for the Australian Broadcasting Commission, said; "There are three imperatives: To reduce war to a minimum; stabilize human population; and to prevent the progressive destruction of the earth's irreplaceable resources". It is to his last point that I wish to address my remarks. As a geologist, it is obvious, from a professional standpoint, that a new and universally accepted philosophy for resource development and use must be realized if we are to ensure that modern man will continue to exist, even at minimal standard of living levels. It is probably true that intensified efforts in geologic exploration and technological development could provide essential resources for some time into the future.

It is also true, however, that demands for these very same resources are increasing at an exponential rate and even now exceeds both proven reserves and our capability for locating new sources. And there are no inexhaustable, ultimate sources. Natural restoration and concentration requires time measured in terms of millions of years, time far exceeding the average individual's comprehension.

The recent report by the Committee on Resources and Man, National Academy of Sciences—National Research Council, points out many of the current resource shortages which exist, and others which may soon be in short supply. The report explodes many of the myths and popular beliefs so prevalent among industrialists and the general public regarding future sources of resource materials and energy. This committee suggests that an industrial society might exist for centuries if population and demand level off at some reasonable plateau and if resources are wisely used. But this same committee also warns that technological development and economic brilliance alone cannot create the essential raw materials for such a society, even if enhancement in value through benefication, fabrication, and exchange constitutes the basic material fabric of such a society. Surely, we have on our hands a dilemma of uncertain proportions.

In a paper to be presented at the 1970 Rocky Mountain Section meetings of the Geological Society of America entitled "Environmental Geology—A State of Mind", Robert E. Bergstrom, Illinois State Geological Survey, infers that the application of geologic information to the increasing problems associated with man's use of the earth's surface looms as a task of crucial urgency. He further states that geologists will have an impact only if lines of communication are open to planners and developers, engineers, municipal officers, legislators and industrialists about problems arising from society's needs. I would also encourage the inclusion of the general public, for geologists, as interpreters of earth materials and processes, have much to contribute to all facets of man's problematical environment. There can be no room for politics or preferential treatment in pollution abatement, population control, or resource use and development. People will have to be told the *real* price of wasted water, excessive consumption of materials, planned obsolescence, etc. All citizens, regardless of status, must be educated in a society which acknowledges limitations on profit and pleasure in the name of good environmental housekeeping. Exploitation must become both unpopular and unprofitable. The costs will be high and therefore should rightly be shared by producer and consumer alike. But this is the necessary investment that must be made in the future of man.

One must wonder why, in just the past 20 or so years, there has been such a dramatic shift from the Ben Franklin concept of thrift as an admirable and respected quality to the present admiration of consumerism. This is an objectionable trend, one which seems to be contrary to traditional values. Our idea of progress as measured by gross national product can be seen today as seriously jeopardizing the very existence of future generations. How can man be so selfishly blind?

Conservation has been defined by J. F. Kennedy as being "* * * in the final analysis, the highest form of material thrift * * *" Similar pronouncements have also been made by other notables throughout our history. Are they to be constantly disregarded? Over one hundred years ago John Wesley Powell attempted to sell a "General Plan" for the conservation of our environment. To him science was the one discipline that might renew and enlarge all resources in the long run, and the more he saw of men blindly conquering the land, the more he became convinced of the importance of science as a tool of national progress. Yet, based on present resource projections, I would venture to guess that the conservation practices have hardly been part of the American way of life. I do not wish to advocate the demise of the frontier brand of individualism, but somehow the "cowboy" attitudes regarding our use of the earth must be replaced by a new consciousness and a new national purpose.

Improvements in the quality of the environment and of life can be achieved at a lower level of resource consumption than is the "American standard" of today. General acceptance of a new philosophy is warranted and can be attained, either by legislation or through an educational process which develops individual concern and pride. The latter method is much preferred. But what should this new philosophy be? In his book, *The Meaning of the 20th Century*, Kenneth Boulding applies thermodynamic concepts of entropy to man's social and economic systems. He points out that the entropy problem of a system running down manifests itself in several forms, the most obvious being the diffusion or concentration of materials. Thus he distinguishes between entropic processes which diffuse from concentration (the use and development of natural resources) and anti-entropic processes which concentrate from diffusion (conservation, reclamation and reuse of materials). It is perhaps fortunate that it is within man's capability, pending the availability of energy, to reverse entropic processes. It is therefore possible to conceive of the earth as being a stable closed-cycle spaceship dependent on our ability to concentrate from diffusion those essential resources which will ultimately be diffused again according to man's needs. The energy needed to drive the system is within the technological grasp of man. We can only hope that our educational system can ultimately divert the necessary human energies in support of the space-age philosophy that man can *begin* to *gain* harmony with nature.

(Testimony by Marshall K. Corbett, Chairman, Department of Geology, Associate Professor of Geology.)

THE STUDENT AND THE FUTURE

Criticism of H.R. 14753

The need for a congressional bill treating the problems of environmental degradation has been pressing for many years. It is somewhat disappointing that H.R. 14753 is being drafted only after public outrage at the progressively worsening condition of being alive in America has demonstrated that it is safe to do so. Being in favor of upgrading the environment has become a safe political platform now. Opposing environmental quality has become like being against motherhood or red, white and blue. Since this happens to be an election year, I am rather confident that passage of this bill will provide a most reassuring steppingstone to re-election of its proponents.

Environmental problems have been overlooked and ignored for decades because men in influential positions chose to side with a thousand little kings whose disgusting philosophy of growth for the sake of growth could not encompass an empathy for the future generations inheriting the earth. The greedy and ravenous appetite for profit inherent in these obscene gluttons has turned our once beautiful nation into a succession of river sewers, deserts and hideous piles of trash. Our skies are rapidly turning brown as we bury ourselves under a sea of noxious scum. The lack of wisdom which has permitted the systematic destruction of our precious planet is inexcusable and must be dealt with harshly and in a spirit of impending immediacy.

Spurred by the increasing problems of environmental deterioration being suffered in the United States, students (most of them viewed as bums and intellectual snobs by Dick Nixon and Spiro Agnew) banded together to sponsor non-partisan teach-ins at their schools. April 22, 1970 will be remembered in America as the beginning of environmental awareness as hundreds of thousands of Americans gathered together to discuss the ramifications of our unique and very dangerous problem—potential extinction.

The Environmental Teach-ins have accomplished, for the most part, the goal of defining the problems and offering possible solutions to these problems. For this effort the bums and snobs are to be congratulated. H.R. 14753 has the potential of carrying on the environmental teach-in format to an effective end if certain conditions are met:

1. The issue of environment is far beyond being a partisan issue. The success of this bill depends upon equal cooperation of all factions working together and sharing knowledge. Therefore, the Commissioner of Education should be advised by the various factions before making policy decisions.

2. The educational projects relative to the bounds of this bill must be generously funded if the bill is to be effective.

3. It must be stressed very strongly that in order for environmental quality to return to the land we must decrease our burgeoning population. Environmental degradation is but a symptom; overpopulation is our greatest threat to existence. H.R. 14753 should make available vast sums of money to the service of educating the public about birth control. After all, we give millions of dollars to the so-called underdeveloped nations for this purpose.

4. From my own cursory research, I have arrived at the conclusion that it may be too late for "civilized" man to save himself. Ninety per cent of America's drinking water is below standards set by the Federal Government for water quality. Our rivers are becoming fire hazards and our land, one vast garbage dump. The American people, especially the students, are giving up hope for a liveable future. Drug abuse has spread like wildfire from coast to coast and present estimates indicate that heroin will be available in every high school in the country within the next 10 years. The spreading drug problem must be viewed in its true perspective as another symptom of the same problem, disillusionment with the destructive, spirit-killing way of life that has evolved in our nation. We have, in fact, become like an irrupting population of lemmings undergoing traumatic mental decay preparing for mass suicide which has already begun and will continue as environmental quality continues to decrease.

Time has run out! We must act to amend this long overdue bill where needed and set it in action, NOW.

(Testimony by Rick Carron, Senior Biology Student and Coordinator, Eco-Alliance Committee.)

THE STUDENT AND THE FUTURE

Analysis of H.R. 14753

1. Page 1, Section 2A, Line 7:

"Nation's" should be changed to "Earth's Environment". If we are talking about ecological balance, this does not just deal with the United State's ecological balance but with the earth's environment. If we use the term "Nation", we are admitting ignorance of the totality of the meaning of ecological balance.

2. Page 1, Section 2A, Line 8:

The phrase "is in part due" is vague and also leads one to believe that there are other reasons for the deterioration of the quality of the environment other than a "poor understanding by citizens of the Nation's environment." These other reasons should be brought forth at this point if they exist because "this act may be cited as the Environmental Quality Education Act."

3. Page 2, Section 2A, Line 2:

"Resources"—Does this mean money?

4. Page 2, Section 2A, Line 3 and 4:

This section is very good with strong wording.

5. Page 2, section 2A, Line 7:

"Encouraging understanding of policies."—What exact policies is this referring to?

6. Page 2, Section 2A, Line 9–18:

This is a very good listing of who should be educated on these problems of environment; especially important are community education programs.

7. Page 2, Section 3–lb., Line 7:

How and who will determine the effectiveness of curriculums?

8. Page 3, Section 3-lb, Line 8 and 9:

This is very good because it enables existing programs to be eligible for dissemination of their materials.

9. Page 3, Section 3, Line 21–22:

Does this include private schools?

10. Page 4, Section 3 and 4, Lines 4–7:

This is good, includes churches and private schools.

11. Page 4, Section 4A:

All the power of this environmental quality act is vested in the Commissioner (United States Commissioner of Education), who is appointed by the President of the United States. The President, therefore, indirectly has all the power. For this reason, the program will be partisan and subject to the whims and wishes of the party in power.

12. Page 5, Section 4A, 3:

I don't understand this.

13. Page 5, Section 4A, b:

Why does the state educational agency need to be notified of the application and be given the opportunity to offer recommendations? It seems to me that if this section is included it gives a loophole for the state to control exactly what it wants to be taught in an environmental education. This could lead to an unbalanced understanding of the environment. This particular section should be clearer on its intent. So, if conflicts occur, they can be handled with ease.

14. Page 6, Section 5A:

Because of the importance of the environment and ecology, especially at this time of no return in our Nation's history, I would like to bring forth the proposition that the Committee on Environmental Quality Education should be more than just an advisory committee. It should have the power to implement its decisions in coordination with the United States Commissioner of Education and the Secretary of Health, Education and Welfare.

15. Page 6, Section 5B:

The Secretary of Health, Education and Welfare appoints the "Advisory" Committee and the Chairman. The Secretary, therefore, not only controls the committee—and to a greater degree, the Chairman; but also, because of this power, determines if and when they shall meet. It is not unreasonable to envision the committee never meeting.

I would also like to take exception to the terminology used in line 11, page 7—"familiar with"—The committee members should be far more knowledgeable about environment than just "familiar with" the problems. With a committee of 21 members, the top persons in the nation on environment could make up a strong, useful committee.

Because I feel that the committee should be far more than advisory in nature, may I suggest that they have the power to overrule the decisions of the United States Commissioner of Education by a ⅔ vote to convene at not only any time that the Chairman, Secretary of Health, Education and Welfare and/or commissioner deem it necessary, but also if and when ⅔ of the committee call a meeting. In this way, the power which is vested in his act to educate the people can be distributed among the Secretary of Health, Education and Welfare, the Committee, the Commissioner and the Chairman.

The appointments of members to the committee by the Secretary of Health, Education and Welfare should be approved by Congress, and should be as nonpartisan as possible (being there specifically to express their opinions about the environment and not those of various interest groups).

When we as "reasoning" men are attempting to design an "Environmental Quality Education Act", we should enumerate in a rational way what we mean by Environmental Quality, decide how critical these problems are, and determine who should have the power to decide what is important to educate the people about these problems.

It is my belief that when we consider the three points mentioned above this bill, H.R. 14753, is very short sighted if not blind to how important a bill of this type is.

Some may say, "But, it is a first step." Let me bring forth the proposition that if we are to make a first step, let's make it the best step that we as men can rationally make, and not spend the next few years of this program wasting time placing band-aides and patches over our bruises but better spend our energies and resources winning this battle against time.

My future and the future of my son depend on the strength and nonpartisanness of a bill of this type. For these reasons, I am against H.R. 14753 in its present text.

(Testimony by John P. O'Connor, Graduate Microbiology Student and Public Relations Man for Eco-Alliance Committee.)

The Environmental Quality Education Act and the Problem of Environmental Destruction

In behalf of concerned biologists and others interested in the conservation and improvement of our environment, we would like to add our support to the Environmental Quality Education Act.

The existence of a national environmental crisis is well known. The magnitude of the problem is emphasized by the fact that even in Idaho serious and extensive degradation of our land, air and water is taking place.

Mountains and rivers are being destroyed by the short-sighted quest for additional profits. Water and air pollution threaten our health and well being. Even within the City of Pocatello, monuments to the ignorance and lack of concern of the people exist in the form of serious industrial pollution of the air and defilement of the Portneuf River. These insults are all the more serious because they exist in an area still relatively free from the pressures of a burgeoning population. Rather than being seen as the symptoms of a sock environment, they are looked upon as insignificant changes and written off as the cost of progress. With our abundance of natural resources, Idaho's citizens (as those elsewhere in the nation) tend to overlook the loss of an "occasional" stream through dredging, or construction, or other forms of pollution; the mountain that is obscured by air pollution or laid waste by open pit mining; or the field that is scarred by erosion. For there always seems to be other streams in which to fish, other mountains to enjoy, other fields to plow. They fail to realize that this will not always be the case, if we continue on our present path.

Much of the knowledge necessary to solve the present environmental crisis already exists. However, we presently lack a satisfactory and sufficient means for disseminating this information. Public *awareness* of the problem must be further developed. Individual and group *action* must be stimulated and directed along constructive pathways. Intelligent decisions cannot be made or action taken without a clear understanding of the problem and its implications. The Environmental Quality Education Act would help to fulfill these needs.

The need for public education and concern in the area of environmental quality was recognized by a number of individuals at Idaho State University even before the Environmental Quality Education Act was made public. We have already instituted new courses and redirected others toward solution of the problem. There is underway at the present time on this campus a move to develop an interdisciplinary program of Environmental Studies. Thus, we intend to lead the way in environmental quality education and we welcome the Federal Government's interest and support in this area. The recognition of Federal responsibility in the fields of environment and population is long overdue.

Addendum: Specific areas of the proposal which we feel need clarification.

Section: 4: (a): (3)

Financial support should not be solely in terms of supplementary funds. Outright grants and other support may be called for in specific cases.

Section: 5: (b)

The composition of the Advisory Committee on Environmental Quality Education is a critical issue which should be given serious consideration. The choice of participants may well determine the success or failure of the program.

(Testimony by G. Wayne Minshall, Assistant Professor of Zoology; Edson Fichter, Professor of Zoology and Curator of Mammalogy, and Fred L. Rose, Assistant Professor of Biology.)

Statement in Support of H.R. 14753

During the three days of the student-organized Environmental Teach-in held on the Idaho State University campus, 22–24 April 1970, the indispensable role of education in a massive effort to assure our survival beyond the next few decades was frequently evident and, I think, universally acknowledged. The need for increased emphasis on such educational undertakings was evidenced by (1) the statistics on the growth of the human population and its most obvious corollary, pollution of earth's total environment, (2) the searching nature of many of the questions asked, and (3) the frightening lack of comprehension displayed by some of the participants who occupy sensitive positions in local government and resource management.

In earlier correspondence with Representative Orval Hansen (22 January 1970), I expressed my profound concern for the quality of human life and my support for H.R. 14753; my recent observations confirm my belief that the educative process must be at the forefront in man's effort to save his environment from further and perhaps irreparable destruction. I am further convinced that much of the educational effort must allow for *innovation* at all levels; that it must give both students and teachers the freedom to be creative, not only in solving environmental problems, but in learning how to recognize them.

It also strikes me that the current wave of ecological consciousness and concern for the earth's ecosystems can be kept viable only by way of an educational program directed at all of our people.

In view of these imperatives, I urge all who are involved in the legislative process relative to H.R. 14753, to ponder deeply the inevitable consequences of continued ignorance of and disregard for the ecological laws to which we are inescapably subject, individually and as a species population.

(Testimony by Edson Fichter, Professor of Zoology and Curator of Mammalogy.)

ENVIRONMENTAL EDUCATION THROUGH STATE EDUCATIONAL STRUCTURES, RECREATION AND THE COMMUNITY SCHOOL CONCEPT

I. INTRODUCTION

As presently proposed, H.R. 14753 represents a major landmark in legislation dealing with our environmental problems. The bill does so in a way most central to the solution of our environmental problems: through the education of both young and old in our society.

However, the size of our environmental education job is of such magnitude that success can come only through the most comprehensive plan imaginable. The number and variety of educational agents—both public and private non-profit—is such that only the most innovative local, statewide and national interbody planning and attack can hope to achieve success in the environmental education task before us. No fragmented and piecemeal environmental education will suffice as an approach to the problem which is truly a matter of life or death for us and our world.

II. RECOMMENDATIONS

In line with the nature of our task of environmental education and the excellent principles found in the Environmental Quality Education Act, the following major points are recommended for consideration by the Select Education Subcommittee.

First, H.R. 14753 should provide an opportunity for and encourage statewide planning and attack upon environmental education. This can be achieved (1) through the guidance and leadership of each state education agency and (2) through a required state comprehensive plan for environmental education.

Second, H.R. 14753 should foster federal, state and local level inter-agency cooperation and effort through the community school concept.

And, third, H.R. 14753 should foster the development of school grounds as outdoor learning laboratories for students and as models of quality environment for urban living and general public environmental education programs.

Let us now consider in detail each of these three major points.

III. STATE EDUCATIONAL AGENCY AND STATE PLAN FOR ENVIRONMENTAL EDUCATION

The Environmental Quality Education Act should require that the state educational agency be designated as the state's agent for administering the E.Q.E.A. and for taking the leadership in state involvement in environmental education. This requirement should include the development of a comprehensive state plan for environmental education. In these two respects, what is being proposed closely parallels the two requirements now operating effectively in the Land and Water Conservation Fund Act.

However, the state educational agency structure for administering the E.Q.E.A. should also tap other key leadership. State agencies, private non-profit organizations, and professional societies having key concerns and programs in environmental education and recreation should be brought into the structural and planning scheme. In effect, there should be a broadly based state environmental education body within the state education agency.

A comprehensive state plan for environmental education should be a requisite for the orderly achievement of the objectives of environmental E.Q.E.A. This plan should be based upon statewide planning concepts and constitute a workable state plan for environmental education.

Such a state plan should include a number of essential characteristics. It should identify the status of current environmental education programs as being conducted by the many organizations (both state and local. public and private nonprofit) so involved; this identification should include other agencies which could be potentially involved. The plan should include some assessment of current and future needs and plans for environmental education as seen by the many organizations concerned. An inventory of existing and needed resources for environmental education should be included in the comprehensive state plan; this inventory should include personnel, programs, finances, building facilities and outdoor areas.

The state education agency plan, a key part of the comprehensive state plan for environmental education, should include the satisfaction of the E.Q.E.A. requirements relative to a minimal environmental education program for the state's public school system. These minimal requirements would relate to state education code requirements, teacher education and certification relative to environmental education requirements, etc.

The comprehensive state plan could serve many desirable functions. It could, for example, serve as an immediate and long-range planning and programming tool; help establish project priorities; help in grant allocation; and, serve as a comprehensive plan for policy formulation decisions directed toward achieving state and local environmental education objectives. One of the chief uses of the plan, when coupled with the state environmental education agency, would be that of fostering a united, statewide, extensive and coordinated attack upon the problems of environmental education and thereby preventing a piecemeal and fragmented approach. A still greater advantage of this procedure is that of providing optimum communication, citizen involvement, joint leadership and planning, education and decision making where the action is, and must be—at the local community and state levels. These advantages would tend to strengthen the E.Q.E.A. effectiveness in general as well as the functioning, in particular, of the Advisory Committee on Environmental Quality Education as it performs its duties (Sec. 5, H.R. 14753).

IV. COMMUNITY SCHOOL CONCEPT

The community school concept should find a prominent position within the E.Q.E.A. The concept includes the fundamental idea of multi-agency cooperation and sharing in the utilization, and related goal achievement through community use of facilities and areas needed for general and environmental education and recreation. In the case of the municipality and the school district, the concept includes cooperative financing and maintenance of facilities and areas needed for the pursuit of educational and recreational programs and goals.

A brief consideration of the community school concept will reveal the affinity between the community school concept and the environmental education objectives for children, youth and adults as reflected in H.R. 14753. And, in so doing, the consideration will also illustrate, it is hoped, the desirability of H.R. 14753 fostering the growth of the concept as a major tool for achieving environmental education at the community level.

A basic rationale for the community school concept is given by Charles L. Mand of Ohio State University when he states:

> Many feel that it is extravagant with respect to space and tax dollars to limit the school to use by children for six hours a day, five days per week * * * (etc.). Rather it is believed that the school facility should be used for adult education in the evening and summer months and the school site should incorporate community as well as school recreation facilities. * * * The concept of using the school site for community recreation has caused the site to be increased in size. This provides opportunity for picnic areas, an arboretum, outdoor classrooms, even a school forest. It is interesting to note that the community school concept enhances the possibility of achieving an outdoor laboratory on school grounds.[1]

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[1] Charles L. Mand, *Outdoor Education* (New York: J. Lowell Pratt and Company, 1967), p. 104.

Julian W. Smith,[2] Director of the Outdoor Education Project (sponsored by the American Association of Health, Physical Education and Recreation), has characterized the community school concept in relation to outdoor education in the following ways.

"The community school functions as a unit in the family of agencies serving the common purpose of improving community living." The school joins with many agencies having responsibilities for facilities, lands and programs for the improvement of living; many of these organizations are concerned with the wise use of natural resources; many are youth-serving agencies concerned with educational and recreational programs, including outdoor recreation; park and recreation departments are also involved. In this mix, the community school often serves as a mobilizing force for concerted action.

"The community school assumes its responsibility for better living by beginning with the immediate school environment * * *" and building a curriculum by starting with local community problems. In this way the school subjects—physical sciences, social sciences, etc.—can be realted to the near at hand natural and cultural environment.

"The community school makes full use of all community resources for learning experiences. * * * Playgrounds, parks, camps, recreation areas, and other available facilities and lands are laboratories for many activities which are included in the usual school program." This, as Smith points out, makes a very strong case for community planning when one can have complete use of all the natural resources for the purposes of education.

In summary of his ideas, Smith describes the community school as "a nearly ideal situation * * * which assumes its full responsibility for a broad educational program, including outdoor education, working cooperatively with all the other agencies in the community to insure outdoor experiences for all children, youth, and adults."[3]

The foregoing illustrates the community school concept to the extent necessary for the purpose of making the specific recommendation point, namely: the E.Q.E.A. should foster the community school concept because of the unique inter-agency cooperation and environmental education opportunities inherent in that concept.

V. OUTDOOR LEARNING LABORATORIES

The third recommendation proposes that the E.Q.E.A. should foster the development of outdoor learning laboratories through a provision for federal financing. This outdoor laboratory stands as a key to the most effective outdoor education program.

Outdoor education is a technique of education utilizing the out-of-doors environment to enrich learning and make it more effective. It uses the out-of-doors to achieve educational goals related to the many subject areas taught in the public schools; it includes conservation education and other environmental education elements. Such has been the nature of the outdoor education technique since its inception in public education in the 1930's.

Today, outdoor education operates in four typical phases. The use by the classroom teacher of the immediate school grounds without special facilities is the first and most immediate phase; in terms of time and distance, but not necessarily function, this phase capitalizes upon the most immediate out-of-doors. The second phase is the teacher's use of an outdoor laboratory incorporated into the school grounds; this laboratory, when available outside her school building, has the added important element of functionality, which makes the school ground a model resource for outdoor education. The third phase of outdoor education is seen in the use of community resources beyond the school premises in the form of parks, zoos, museums, streams, nature centers, gardens, etc. School camping, the fourth phase of outdoor education, has been described as the dessert of the outdoor education program which should follow the main course of systematic and continuous use of the school and community out-of-doors resources.[4]

It should be stressed that the outdoor laboratory phase of outdoor education has many features in its favor for the ongoing educational process, including environmental education. Charles L. Mand emphasizes several of these features: (1) the outdoor laboratory provides an extensive environment for implementing curriculum projects; (2) it removes the disadvantages associated with bus travel to a resource in the community, including extensive time away from school;

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[2] Julian W. Smith *et al.*, *Outdoor Education* (Englewood Cliffs, N.J.: Prentice-Hall, Inc., 1963) pp. 33-36.
[3] *Ibid.*
[4] Mand, *op. cit.*, p. 34.

(3) the laboratory, with its improved and planned facilities, makes possible more sophisticated projects such as plot studies, planting programs and conservation projects which are more difficult to implement without an appropriate and near-at-hand resource, (4) the teacher has a greater opportunity to learn more about the plant and animal life in the specific laboratory area as a result of continuous use and, therefore, teach more confidently; and (5) the outdoor laboratory results in an improved teaching situation in the out-of-doors, thus simplifying the teacher's task and broadening the prospects for student learning.[5]

Mand discusses the operation of an outdoor laboratory, within the community concept, as it functions in New England. His words reveal the dynamic potential for environmental education to be found in both these concepts. In the outdoor laboratory, he states:

> There is a school forest planted and maintained through the years by generations of students, land reserved for picnics, outdoor recreational activities such as bait casting, archery and campcraft. They reserve a plot for Christmas tree production and another as a pine plantation to attract birds and animals indigenous to this environment. A nature trail winds through the forested area and is also maintained by students. Students pursue biological studies through the assignment of "plots" in various parts of the laboratory. An arboretum including trees and shrubs that attract and succor wildlife is also part of the overall plan. The interesting points regarding all these facilities for out-of-door study and enjoyment are that they are used by students at all grade levels, promote self-direction in learning, provide opportunities for community service by students, enhance recreation opportunities for all citizens. * * * [T]he mark of success regarding the venture is that there is a very minimal amount of vandalism in the area. Evidently students and others through the years have developed an appreciation for the out-of-doors and an understanding of the value of the natural world to man.[6]

William B. Stapp, Conservation Consultant for the Ann Arbor Public Schools, has provided an integrated and effective picture of the outdoor laboratory's many facets and operation in Ann Arbor, Michigan. See the attached reprint entitled "An Outdoor Laboratory for Your School." His summary puts forth a strong case, so this witness before the hearing feels, for federal support in the development of outdoor laboratories in our public schools. Stapp's experience indicates that:

> The school site *can* be used effectively and *should* be used to enhance instruction programs. School land *can* play a key role in helping our students increase their interest, awareness, and understanding of the natural environment. As a result of this greater awareness, and understanding of the environment, I strongly believe that students will take a more active interest in issues relating to man's environment. It is through this greater interest and understanding of the general public that progress can be made in solving some of our major resource issues of the present and the future.[7]

In marked contrast with this potential for environmental education through the outdoor laboratory, let us consider the more typical school grounds surrounding the school buildings across the nation.

Too often the "development" of the school grounds consists of the planting of a shrub or other plant at the front corners of the building. In rare instances the school board allocates sufficient funds for an adequate landscape plan. Yet, inside the building, so two landscape architects point out, "the latest, and frequently the most expensive, equipment and decoration are employed so that the students may have only the best and be in an atmosphere that will improve their taste and sense of appreciation of the beautiful. * * * We hold, however, that well-designed and carefully maintained school grounds are just as important a part of a well-rounded educational environment as architectural embellishment of the building's facade, or its interior decoration." [8]

Here we see two distinct expressions of a strongly held belief that man is conditioned by his environment. What, then, is the nature of that conditioning created by a sterile, drab, undeveloped school yard? Is it, as Peter Blake has stated in describing most of us as befoulers of our environment, "people without ties to the landscape or townscape in which they live, people whose eyes have lost the art of seeing * * * all * * * who no longer care, or no longer care enough"? [9]

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[5] *Ibid.*, pp. 102-103.

[6] *Ibid.*, p. 106.

[7] William B. Stapp, "An Outdoor Laboratory for Your School," *Ward's Bulletin* (December, 1965).

[8] H. Stuart Ortloff and Henry B. Raymore, *The Book of Landscape Design* (New York: M. Barrows & Company, Inc., 1959), p. 289.

Whatever the answer to the question of effect, many implications point to the desirability and logic of environmental education in a quality outdoor setting. It must be a setting which offers the learner more as an example and inspiration for imitation than a colorless, denuded school ground used only for recess, physical education and fire drills.

A question for us, however, is: how can an environmental education setting be improved so as to reflect more accurately and reinforce our educational objectives. How can schools across the nation develop their grounds for maximum use as outdoor learning laboratories and as examples of quality environment for the entire population.

It is here recommended that federal funds be made available through either H.R. 14753 or a broadening of the Land and Water Conservation Fund provisions to permit school districts to use this fund more easily. In either case, increased federal funding would be necessary.

(Testimony by Robert T. Gregory, D. Ed., Associate Professor of Recreation, Head of Intramural Program.)

MEMORANDUM

To: Superintendents and School Principals.
From: Richard Kay, Consultant, Science and Mathematics, Idaho State Department of Education, and Austin F. Hamer, Specialist, Resource Utilization, Bureau of Land Management.
Subject: Information for Your File on Outdoor Laboratories.

Recent action by the State Board should enable us to give more positive help in the area of Conservation Education, up to date help that, promises real advancement in this critical area.

AN OUTDOOR LABORATORY FOR YOUR SCHOOL

(By William B. Stapp, Conservation Consultant, Ann Arbor Public Schools, Ann Arbor, Michigan)

In most school systems little or no consideration is given to ways the school site can be used to enhance the school curriculum prior to the construction of the school building. For this reason many of the unique educational features on school sites are lost during the construction stage. The site becomes leveled, the native vegetation is stripped from the land, and the natural water areas are destroyed. Under these conditions the learning opportunities are far more limited, the environment is less pleasing, and the microclimate is more severe.

If one believes, like I do, that certain social and scientific understandings can be best taught beyond the four walls of a school building, then educational specification plans should be developed both for the site and the building.

I would like to describe a procedure operating in our school system that is effective in establishing outdoor laboratories on school sites.

In the selection of school sites, consideration is given to locations possessing natural features that can be utilized to enrich the school's educational program.

Once the land for the school site has been acquired, a school site committee is established to develop educational specification plans for the total site that will take advantage of unique natural features on the site. The site planning committee can be of great assistance to the school architect in making recommendations, such as, taking advantage of uneven topography in the layout of the site plan, the preservation of unusual specimen trees, or an area possessing a variety of habitats for an outdoor laboratory. The planning committee should be composed of a school board member, the school architect, the school principal, teachers representing various areas of the curriculum, and students. Joint planning between administrators, teachers, and students will enhance the use of the school site, discourage vandalism, and perpetuate its use and value to the community.

During the period that heavy equipment is on the site, provisions must be made to make certain that the recommendations submitted by the site planning committee and approved by the school architect are fulfilled. It is important that the operators of heavy equipment be well oriented to the site plan and to the features on the site that are to be preserved. It is usually advisable to place markers around trees or habitats that are to be undisturbed.

As the school is being constructed, the landscaping phase of the site can be developed. This plan should be well conceived to blend beauty and utility.

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[9] Peter Blake, *God's Own Junkyard* (New York: Holt, Rinehart and Winston, 1964), p. 7.

Plantings that provide food and cover will attract small animals for observation purposes that might otherwise not be seen around the school building. Thought should also be given to the placement of plantings to improve the microclimate. Proper plantings can make classroom and recreational areas more comfortable throughout the year.

Technical assistance is normally available to every school system through the services of the district soil conservationist, game manager, and forester. The district soil conservationist is available to assist schools by making a soil map of the site. A soil map is very useful in selecting trees and shrubs to plant on the school ground. The soil conservationist might also be helpful in determining the suitability of the creation of a small pond on the site. The district game manager can offer technical assistance as to types of plantings and their placement for wildlife. The district forester could provide schools with information regarding the availability of free or inexpensive planting stock from the state nurseries. Few school systems avail themselves of the free services rendered by these federal and state employees.

In every subject matter there are important understandings and concepts that can be best taught on the school site. As an example, just recently a one acre shallow pond was created in the outdoor laboratory of our high school. Basic physical, chemical, and biological data of the pond were obtained by high school students. To determine information on water volume and depth contours, mapping skills acquired in math classes were utilized by students to make a hydrographic map of the pond. Chemical data of the water, such as dissolved oxygen, carbon dioxide, and alkalinity, were collected by applying techniques developed in chemisrty classes. The biology classes made a biological analysis of the water and bottom sediments. Students enrolled in conservation classes are presently compiling the data and developing a fish planting program.

The pond and surrounding land that comprise the outdoor laboratory on our high school site is used not only by science classes. Social studies classes use the outdoor laboratory to discuss social concepts. The industrial arts department has constructed a sturdy dock and a barge for water sampling on the pond, as well as nesting houses, trail signs and sampling equipment used by students to carry out basic research. The mentally retarded classes have constructed wildlife shelter and feeding demonstrations and assume the responsibility of placing food in the feeding trays during the winter months. Art classes frequently use the laboratory for sketching and painting. Elementary and junior high school classes, that do not have adequate outdoor facilities on their own school sites, frequently use the outdoor laboratory for natural history, ecological, or conservation oriented field trips. Many community youth groups use the outdoor laboratory after school hours for field trips or to volunteer their services for work duties. Youth groups have been very helpful in maintaining trails in the laboratory, planting shrubs and trees, and in maintaining the various habitates. The outdoor laboratory also serves as a natural area for family groups to enjoy.

Once an outdoor laboratory is established, it will probably be used the year around. In Ann Arbor the recreation department hires a naturalist during the summer months. This individual conducts informal outdoor nature programs for early elementary children and a formal field science program for late elementary and junior high school students at the high school outdoor laboratory. The public school system offers a seven week summer enrichment course in field biology and conservation at the high school. This class makes extensive use of the outdoor laboratory every day. Once established, outdoor laboratories will be used by individuals, youth groups, and classes throughout the year.

Once teachers experience the amount of learning that can be achieved and the excitement generated through the use of the school site, the utilization of the outdoor environment will become a way of instructing that will add a new dimension to the teacher's effectiveness. However, few teachers are trained in our colleges and universities in methods of using the natural environment to enhance instructional goals. For this reason an in-service training program might be necessary to maximize the use of the site that has been developed to extend instruction beyond the school building. The most effective type of in-service training is that which is taught in the natural environment. It is best to offer an in-service training program regularly through the school year. It is hoped that in the future our teacher training institutions will play a leading role in helping teachers to acquire the skill needed to effectively utilize the school site to enhance instructional programs. The higher institutions could also alert administrators to the many existing agencies at local, state, and national levels available to assist school officials in school site planning.

The school site *can* be used effectively and *should* be used to enhance instruction programs. School land *can* play a key role in helping our students increase their interest, awareness, and understanding of the natural environment. As a result of this greater awareness, and understanding of the environment, I strongly believe that students will take a more active interest in issues relating to man's environment. It is through this greater interest and understanding of the general public that progress can be made in solving some of our major resource issues of the present and the future.

How about an outdoor laboratory for your school and community?

A CONSERVATIONIST'S APPRAISAL OF H.R. 14753

My name is John H. Merriam and I reside at Route No. 3, Pocatello, Idaho. I am presenting this statement in the dual capacity of a professional educator and as a conservationist. I am Chairman of the Department of Economics at Idaho State University and president of the Greater Sawtooth Preservation Council, a non-profit Idaho corporation concerned with the protection of Idaho's magnificant mountain wilderness areas. It is a pleasure to add my unqualified support to the bill which your committee is considering. I note with considerable pride that a co-sponsor of this legislation is Idaho's Second District Congressman, the Honorable Orval Hansen.

The problems of our endangered environment are unmistakably clear today. They fill the pages of nearly every national magazine and newspaper; we are told that the 1970's will be the "Age of Environment". If this be true, it is none too soon. The activities of April 22 (Earth Day) show the widespread support for the effort to salvage our environment from the destrictive forces we have set in motion against it. This is a movement almost unique in American political history, for it cuts across the boundaries of partisan politics. No political party has or should have a monopoly on concern for the quality of our environment. This issue involves nothing less than a fight for survival of the human race and a continuance of life upon our planet. At the moment we are losing that struggle.

One of the forces which prevents effective action is the force of ignorance. Two weeks ago an official of the State of Idaho stood before an audience at our university and told us that he was uncertain that any environmental problems existed. Such an experience is both shocking and instructive. I am the father of two small children. Like others of their generation, my children were born with strontium 90 in their bones and DDT in their tissues; some scientists predict that these children may never live to maturity. As a father and an educator, I am aghast at the ignorance of those who tell us that there is really no problem.

The point of the story is not particularly to ridicule one of our state officials, but to illustrate that sublime ignorance of the state of our environment still exists, even in high places. And, when our civilization is set on a collision course with disaster, such ignorance cannot be tolerated. It is high time our schools and universities shouldered their responsibility to provide the knowledge required to first recognize and then solve the massive problem with which we are faced. This bill is an excellent one, for it will help provide the means to meet this awesome responsibility.

Investment in education is probably the best investment which our society can make, but the returns on this investment come only after a period of time. There are those among us in the academic community who contend that the time may have already run out. Even the more optimistic forecasters hold that the time remaining to revise our ways is terribly short. I am not certain that an investment in education, with its delayed payoff period, is a complete answer to our environmental problems. We must have stop-gap measures and we must have immediate crash programs to regain our environmental sanity and preserve human existence.

In the long run—if indeed there is to be a long run—it will be education that wins the day. As indicated above, this bill is not the total answer to our problems, but it is a vitally necessary part of the prescription for recovery. As a conservationist, I have often been called a "flower sniffer" and "bird watcher". I admit to both of these unpardonable sins, but we must realize that the stakes today involve more than the chance to look at a beautiful sunrise or observe a wildflower. This bill will help with our environmental problems; I respectfully recommend its favorable consideration with all deliberate haste.

(Testimony by John H. Merriam, Chairman, Department of Economics, President, Greater Sawtooth Preservation Council.)

STATEMENT OF ROBB BRADY, EDITOR, THE POST-REGISTER, IDAHO FALLS, IDAHO

My name is Robb Brady. I am editor of The Post-Register newspaper in Idaho Falls, Idaho. I am here today to offer my support for the enactment of H.R. 14753 in the U.S. House of Representatives, the so-called Environmental Quality Education act.

It is a bill, in fact, which, coming after a long national enduring of environmental deterioration, faces a most critical challenge in righting past wrongs. While not exclusively, this bill addresses itself to the young in the cherished hope that they will do what an adult world has been all to complacent about. To me, one of the most significant contributions of the legislation would be in the training of teachers qualified to profile the importance of plant and life processes to man's environment. Quite plainly, there is nowhere near the teacher corps needed to teach the new awareness and the new values and the practical new ways to strike that compromise between what we need to live and what we need to live fully and healthfully. Such a corps must be trained.

In Idaho Falls, the worth of the objectives of this bill have already been signally demonstrated. In my home city, the Snake River Center for Improvement of Instruction has been utilizing funds under the Title III outdoor education program to teach elementary students the fundamentals of *environment. It has* shown, of course, not only the need of qualified teachers but the efficacy of the program as well. Outdoor education has a tremendous appeal to youngsters naturally and it appears to stimulate a student otherwise jaded by the rest of the curriculum. But, in motivation, it was the application of outdoor education in a volunteer program by Charles Clark, director of the outdoor education division of the Snake River Center, which underscoerd the importance of this program. It was a deft combination of outdoor recreation and outdoor educational experiences which tapped an interest resulting in the graduation of two of several dropouts. There is a magic to the outdoors for most youngsters and they identify with it. The outdoor education program as being utilized under Title III, the Elementary and Secondary Education Act, expires this spring. The new act is the building block for a widespread and more penetrating continuation of this program.

The special problem of school districts now participating in the Title III Program in Idaho will be to find some way of continuing this program until the proposed environmental act can apply.

But environment is not just a picnic experience. It is not just a trail outing. Environment must be learned. And we need to learn the basic process of nature, and in a cause and effect way. What happens to a fishery when a road is built alongside of a trout stream without thought to meanderings, soil drift into the river, and lack of cover. Why is winter range so vital to Idaho's big game and what is happening to Idaho's winter range? What happens when we dam a river without sufficient facilities for passage of migrating salmon? What happens to old and diseased timber in Idaho's forestlands? These are questions most relevant to Idaho and which has summoned a special interest among old and young alike the past few years. Idaho, as most states, has already found out how vital a wholesome environment is to its future. It is most practical, if not necessary, for Idaho to find ways to develop while still preserving her distinctive liveability. This is the special challenge of the state. Consequently, environment is not just an aesthetic consideration. It is one which will determine how wisely she handles her resources, how wisely she seats her industries, and what standards she applies and enforces in sustaining her unique liveability. Many Idahoans themselves have not awakened yet to the unique treasury we have in forest, lake and stream and the importance of both using and preserving in proper ecological balance. Idaho has a special stake in the Environmental Quality education act. It represents a late beginning but a most fortuitous one.

A recent report by the Intermountain Regional office of the U.S. Forest Service, I thought, put the problem and the challenge in perspective. Stated the report in part:

"The chain of life links together plants, insects, animals and even man himself. Each inhabitant of the earth interacts with the air, water and soil upon which survival depends. The nature of things includes both life and death. . . .

. . . National forests are living, changing communities where scenes cannot remain forever the same. There is a place and a time for grazing livestock, harvesting timber, mining minerals, for building dams, and campgrounds, roads, trails and ski developments. Just as there is a time and place to defer grazing, refrain from harvesting trees, and do without reservoirs, roads, mines, trails, campgrounds and ski developments. Decisions must be based on what results in the greatest good for all".

ENVIRONMENTAL EDUCATION THROUGH THE STATE EDUCATION AGENCY

(By Richard Kay, Science Consultant, Department of Education, Boise, Idaho)

OUR PROBLEM

Western man, through his unexpressed philosophy of solipsism, wherein man, the only real being of value, possesses absolute control, has created an ethic that places him above the laws of nature. Man's attitudes, values, and behavior are attuned to the exploitation of the earth as though there are no consequences. This philosophy and these values must be changed if man is to survive. The magnitude of the task cannot be overstated. It is not simply a matter of understanding. No degree of scientific literacy nor application of the human mind to technological/ecological progress will solve the problem.

Environmental education attempts to change attitides and personal values. Its objectives are primarily affective and seek the development of a personal and a national environmental ethic. Instruction is interdisciplinary, having its conceptual base in the science of ecology. But being a problem of economics and the social sciences, it transcends all other artificial discipline boundaries. Human attitudes, values, and ethics are basic to the education program with the goals being primarily affective. The skills of inquiry and process of science must remain the major pedagogical techniques by which these affective objectives are achieved. The facts of environmental education arise in ecological principles, but science cannot mold man's social nature in a direction that will give an understanding of man's role in relationship to the earth on which he depends. The social, technological and educational problems which have become imperatives through the activities of an extractionist, affluent and prolific naked ape will be solved only if every segment of the society is directed to action on a broad based effective educational program.

The economy or ethic which has brought us to this point of absolute committal for environmental education is based on a spiraling affluence which demands more affluence. This creates pressure for more and more use of our natural resources. The numerous resource management agencies, federal, state and local must either yield to this pressure or by educational and public information programs convince us of our folly. These reactionary efforts have attempted to sell "after the fact" the activities of the respective agencies.

Many excellent programs have been the result of these public information activities but the problem is more basic, more imperative and beyond the reach of these isolated efforts.

Colleges and universities which have taught conservation courses have been concerned only with the product of their academic departments. Forestry, wildlife, and range management colleges have looked with disdain on teacher training programs.

Preservation groups, beautification clubs, sports organizations, and many, many others have enlisted support, created programs and made demands on our environment and on our minds to further their own special interests.

Public school systems, being products of academic department oriented colleges, have not received an orientation that permits an interdisciplinary approach to any subject. The methods, materials, even the need for environmental education has not been considered. Pressures in pure science, pure English, and pure mathematics and purer and purer training have led exactly in the opposite direction from those essential to environmental education. The financial bind that schools have had to face has not been conducive to anything except basic curricular offerings. The responsibility for environmental education has neither been assigned nor assumed within our system of public education. The concept of a total educational facility has been ignored. School grounds are blacktopped and concreted. Education has become something that takes place with a captive group, within four walls. The out-of-doors is used only for P.E., recess, and fire drills. The involvement of the community is for bond elections, Christmas programs, and individual disciplinary actions.

The combination of multidirectional, fragmented, and undefined responsibility in environmental education has lead in a full circle to a beginning again.

INTRODUCTION

Environmental education is mankind's key to survival. F. Fraser Darling wrote:

> * * * the strings of past philosophy trail round our feet, making us conservative from a sense of prudence rather than reason. Judaic monotheism put man and nature apart, an idea strengthened by Cartesian dualism of mind and matter. The older Dionysian intuition of wholeness was heresay, and the ancient Chinese comprehension of a universe of checks and balances and compensations, in which man was essentially a part and no more, was unknown and unscientific anyway. (7:299.)

The tools to survival through environmental education revolve around changes in man's basic philosophy. The development of a national environmental ethic with changes in personal value systems through environmental education can only be achieved if certain key attributes of the program are present.

Environmental education must involve every segment of the population. Programs with children should start as early as possible and be relevant to the child's real world. The affective goals are best brought about through direct experience with the environment. Environmental education programs should be built upon the conceptual tool—ecology. Environmental education is interdisciplinary in subject matter content and must be sequentially developed yet remain evolutionary without becoming revolutionary.

We cannot discard the research, curriculum development, and teacher training programs of the 60's. The research in how children learn, the design of programs building upon skills of inquiry, the teaching techniques of inductive learning plus the experience of educators in innovation and administration have all led us into a position prepared for action.

Crash programs designed to effect change and consisting of men and money require direction and leadership. The Environmental Educational Quality Act authorizing the Commissioner of Education to establish educational programs to encourage understanding of policies and support of activities designed to enhance environmental quality and maintain ecological balance can create this leadership. The National Advisory Committee on Environmental Education can give the necessary direction.

It has been pointed out that diverse programs among colleges, governmental agencies, isolated public school systems, private agencies, institutions or other organizations have had little effect and show little promise of achieving the desired goals. Pilot projects, curriculum reformed, or teacher training programs must be conducted within a context of direct action.

All projects should be assigned one central state level educational agency. This agency should develop the necessary leadership to coordinate all programs within the state. Agencies that have been involved in conservation education should be led into a well coordinated and cooperative program. Although most states have already started the move to remove barriers to effective communication and dissemination of information, the key action words—leadership, cooperation, coordination, communication, and dissemination—remain a knotty interface between ideas and action.

STATE PLAN

The State Department of Education should serve as the central coordinating and administrative body for environmental education. A permanent staff to deal with environmental education should be appointed to work with an advisory committee appointed by the State Superintendent of Public Instruction and consisting of representatives from state and federal agencies with a strong interest in environmental education. This advisory committee may be served by a broader, more representative steering committee from various other statewide groups active in conservation.

The state educational agency should then develop a state plan in environmental education. This plan (1) should be designed to influence change through research and evaluation of existing programs and setting of optimum standards for implementing environmental education; (2) should include provisions for curriculum revision K–12 and the implementation plus development of new curricula which are interdisciplinary in nature and based on local educational needs; and (3) should include provisions for teacher training, both pre- and in-service. These teacher training programs should be designed to implement desirable environmental education curricula and provide trained professionals for work in colleges, universities, and resource management agencies.

The state plan should also provide for the development and operation of state environmental education sites with facilities for resident activities plus day camps and make provisions for the development of school sites suitable for environmental education including strong provisions for community involvement.

IMPLEMENTATION

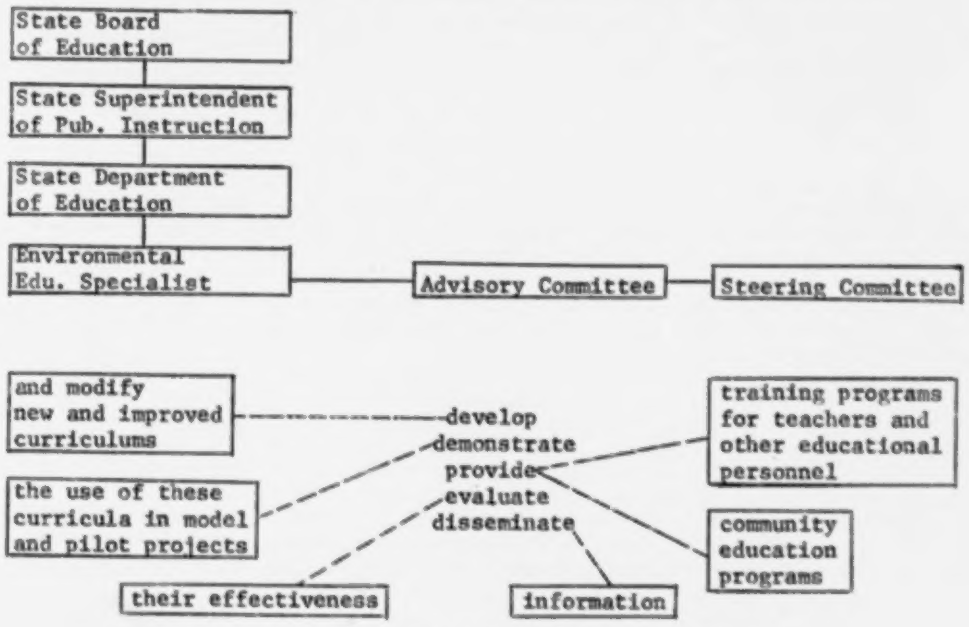
The key to an effective environmental education program is strong leadership at the state level. This leadership should consist of a staff of environmental education specialists and the necessary secretarial help.

The advisory committee on environmental education should be a small groups of intensely interested individuals from the most active state and federal resource management groups plus educational organizations within the state. A representative group might consist of representatives from the State Fish and Game Department, Department of Health, Land and Water Departments, Higher Education, and public schools. Federal agencies such as the USFS, SCS, and BLM should be involved. It may be desirable to appoint a steering committee more broadly representative but less directly involved than the advisory committee. This steering committee might consist of representatives from business, industry, agriculture, civic groups, sportsmen groups, political action groups, etc.

The state plan developed by the State Department of Education which is designed to influence change should include provisions for an interdisciplinary curriculum revision K–12. Existing curricula in environmental education should be reviewed, modified for use at the local level, and implemented. If such curricula do not exist the state plan should include provisions for development of suitable curricula. These curricula should have carefully designed goals and be continously evaluated, field tested, and revised as the need dictates.

A comprehensive teacher training program should be implemented for both pre-service and in-service training of teachers. Changes in institutions of higher learning should also make provisions for the training of professional environmental education specialists including college level individuals and resource management agency environmental education specialists.

Each state should include plans for the development of outdoor education sites to be used both as resident camps, community action centers, and day camps. A model for the establishment of resident camps might be patterned after the outdoor education project for southwestern Idaho, a Title III NDEA project originally administered by the American Falls school district, but currently administered by the Snake River Center as a model for the nation by the Task Force on the Environment. The state plan should also include provisions for the development and use of existing school facilities as environmental education sites.


State Board of Education
State Superintendent of Pub. Instruction
State Department of Education
Environmental Edu. Specialist
Advisory Committee
Steering Committee
and modify new and improved curriculums
develop
demonstrate
provide
evaluate
disseminate
training programs for teachers and other educational personnel
the use of these curricula in model and pilot projects
community education programs
their effectiveness
information

ORGANIZATIONAL CHART

IDAHO STATE UNIVERSITY,
Pocatello, Idaho.

H.R. 14753 ENVIRONMENTAL QUALITY EDUCATION ACT

The rampant and unconcerned destruction of the environment by man should be the concern of all citizens. The forces brought to bear on the fragile balance found in nature must be blunted. This can be done only if the citizen is aware of the environmental crisis and of the possible solutions to the problems involved. This can best be done through an educational program such as proposed in H.R. 14753.

The greatest need at this time is to create in the general population an awareness of the environmental problems confronting man. Informing prospective school teachers and the general citizen is essential and can best be done in the colleges and universities. The production of educational films for the public schools and the general public is another avenue by which to disseminate the information. The professional expertise found in the universities can be most helpful in this matter. Seminars and workshops directed by professionals in sociology, government, biology, etc. are also necessary. H.R. 14753 can be instrumental in funding such programs and in the development of new college currricula which will emphasize environmental problems.

ALLAN D. LINDER, PH. D.,
Professor of Zoology.

LINDE-HUBBARD ASSOCIATES, INC. ARCHITECTS,
Burlington, Vt., April 27, 1970.

COMMITTEE MEMBERS OF THE SELECT SUBCOMMITTEE ON EDUCATION,
House of Representatives,
Washington, D.C.

GENTLEMEN: I have been requested by Representative John Brademas to elaborate on a suggestion I briefly out-lined to him on a proposed "Jury" suggestion to govern the selection of Federally supported projects in the hope of improving our physical environment.

It must be obvious to the most indifferent observer that our physical environment—our man-made structures—are sadly lacking in quality. Since your hearings on the Environmental Quality Education Act are concerned with the problem of educating our citizens to an awareness of their surroundings, it is perhaps appropriate to submit my proposal for your consideration.

Winston Churchill is attributed with saying that 85 per cent of human behaviour is dictated by the space one occupies. In other words, man can shape his buildings, but the building shapes the man. This might be a partial explanation why we, as architects, have such a difficult time dealing with those who spend their working hours in government mausoleums.

Our consensus is, I assume, to take steps to improve the understanding and appreciation of the need for a quality environment. This, your committee is attempting to do by beginning with the young. This is a long overdue and necessary step. I cannot imagine anyone opposing these goals. But my contention is that we already have the talent if it can be properly harnessed, to make a substantial impact on improving the quality of our physical environment now.

On a modest scale, my firm has dealt with various governmental agencies such as GSD, HEW, HUD, FHA, etc. Some are worse than others, but in no case have we dealt with people of power who have the training, background, experience or education to make, in our opinion, the basic judgment decisions which will initiate a building or structure of quality. Where a quality project has been built, it has been a fortuitous accident rather than the result of policy.

The Federal government already wields an enormous influence on the quality of our physical environment. The problem is, how can one improve the understanding of those who wield the levers of power within the various governmental agencies. In my opinion, based on our experience, it is impossible to do so under the present system.

Should the proposed Environmental Quality Act be passed and adequately funded, it would be an ice age before these children could make a substantial impact upon the quality of *their* environment. At the rate we are presently going the legacy *we* bequeath will be a staggering task to clean up.

My suggestion to resolve the dilemma is this: Recognized architects of proven ability should be selected to serve on a jury which would have authority to evaluate all projects which involve Federal financing and public use. All drawings of proposed projects would be judged under rules similar to those which control an authorized architectural competition. Assuming that no extraordinary delays would be encountered, this system should not alarm a competent architect. In fact, such a system might actually speed up the present system of approval. The current governmental system of approval moves with glacial speed. Such a jury system would have an immediate impact upon the quality of our physical environment.

Such a jury system would tap the substantial talents of our profession. It would remove design quality control from the hands of mediocre bureaucrats and presumably, raise the quality of our physical environment.

In addition to the architects, additional "experts" might also be appointed to serve. I doubt if the public or the politicians would swallow an all architectural jury, in fact, additional qualified men would serve a very useful function.

The jury should serve at regular intervals of short duration, be rotated and be adequately compensated. Most architectural schools operate on a jury system so this suggestion should not seem innovative to bonafide architects. We all went through it once. A competent jury would go through many projects within a day.

I can imagine the hurrah of dissent this proposal would arouse within an organized bureaucracy, and even from many within our profession, particularly from those whose designs might be rejected. But, the government and the citizens should be entitled to a better physical environment, and if the government does not have the talent (and, to me, this is an indisputable fact) how can we raise the quality so desperately needed?

I suggest that juries be created on both regional and hieratical basis, with, if this is deemed necessary, a review board system. Regional for the practical consideration of availability and knowledge of local problems; and, hieratical both for review, but, more important, certain projects might require specialized or exceptionally highly qualified experts and architects—power plants for instance, or Federal projects of exceptional importance. The delineation of jury responsibility might be restricted to the size of the project.

Our man made institutions are never perfect, but our legal system as imperfect as it is, does mete out a degree of justice. The same cannot be said for our huge bureaucracies which control so much of our physical environment. This bureaucracy is judge and jury, and controls the financing as well. This omnipotent power is formidable. Unless a drastic change in our evaluation system of design control is created, it will be an ice age before our physical environment is upgraded. Even if we could educate a generation of children to a higher degree of awareness of our physical environment, the task of removing our physical pollution will be horrendous by the time they come of age.

If my suggestion of a jury system seems too revolutionary to apply on a National scale, why not try it on a regional basis as an experiment? I would suggest using the New England region, for here there is a wealth of architectural talent and a reservoir of intellectual interest where such an experiment might receive considerable support.

I suggest that this is a favorable time to propose a system of upgrading our physical environment. Everyone is talking environment. Last weekend Vermonters, went out in force and voluntarily picked up the trash, the beer cans, the "non-returnables", the accumulated junk along our highways. This was an excellent on-the-job training on environmental pollution. People of all ages are troubled about the mess growing up around us, but few are better equipped to do something about it than our talented architects. Our profession, and justly so, can be accused of abdicating its responsibility. We have little lobbying leverage, political power, and too many mediocre people who kow-tow to the existing order, who too often willingly contribute to shlock solutions for the all mighty buck.

I maintain that should you, our political representatives demand, and you have the right to demand, quality in our physical environment, we have the means and talents *now* to accomplish this end. To speak from a biased point of view, I suggest that power must be put in the hands of those best trained to wield it.

The American Institute of Architects are soon having their annual convention in Boston. Perhaps this is the time to spring such a proposal as I have suggested upon Mr. Rex Allen, the President of the AIA, for ultimately our Society will have to be involved.

Hoping I may have been of help to your Select Committee, I remain,

Sincerely yours,

CHARLES J. HUBBARD.

Testimony by Mrs. Betty Little, Basking Ridge, N.J.

I am a conservationist and an economist and I am making this statement in support of the Environmental Quality Education Act because my experience leads me to believe that this is the quickest and most important way in which to meet the environmental crisis.

I have twenty years experience in the field of finance and economists, have spent the last seven years teaching finance at Fairleigh Dickinson University, Madison, N.J. and am currently Co-ordinator for Citizens for Conservation—Bernards Township.

The environmental crisis is most acute in New Jersey. We are already the most densely populated state in the nation and 12,000 persons a year are being added to our population. We are highly industrialized and lying between two large metropolitan areas, we can only expect that our problems will become more complex. Some of our communities are already closed for lack of adequate sewerage, power failure and dimouts are frequent, air pollution alarms soon will be commonplace and large stretches of our rivers are open sewers. Our roads are jammed with cars, our railroads in decay, our governments state and local bankrupt. There are riots in our cities and drugs in our suburbs, we are indeed a state in environmental crisis.

There is a need *here, as in the nation, for a vast reordering of human* concepts and resetting of human priorities in terms of ecology and environment. In a determination to do what we could under the circumstances and with whatever talent we could find, Citizens for Conservation—Bernards Township established in March a speakers bureau (see Exhibit #1 program sheet). We feel strongly that in a democracy the necessary changes will take place only when the people are educated to make responsible choices.

I have come here to report to you about our activities, about conclusions which we have reached from our experience, and about our investigation of possible locations for programs such as ours.

First, our speakers bureau which originally numbered six was expanded to fourteen to meet the demands of the community. In three months of operation we have participated in programs given in four counties, covering six school systems and many private organizations. We have reached over 3,000 persons ranging from three to eighty plus in age. The programs were primarily presented to small groups on a personal basis. We have also undertaken two pilot programs one for a fourth grade and another currently underway for a fifth grade which include a series of class sessions, a project and a field trip to the management area of the Great Swamp. The fourth grade group studied the need for taking an inventory of our environment and of using our resources wisely, the fifth grade is experimenting with soil problems.

Second, from our experience we have drawn a number of conclusions which will be of interest to you in considering this bill.

a. We have gained a great deal of experience in how to teach various groups and age levels, how to involve class teachers, how to use one class to teach another, how to develop classroom materials and where to look for materials and assistance.

b. In doing these programs we have learned more about our environment and have found ways to solve some local problems. The material is dynamic and the longer we have studied it, the more possible it seems to solve the problems.

c. We have recognized a need for environmental centers outside existing school systems. Such centers could provide education for people regardless of education and background. Programs could be flexible and creative and there could be in such centers an opportunity for all segments of the population to make contributions towards the development and running of the center. The success of such a program will depend on the ability of the Center to reach all segments of the population in a meaningful way. It must be a personal education for individual commitment.

d. We feel there is a need for leadership on a national level to channel experience and material and to provide funds for the building of environmental centers or for the restoration or revitalizing of existing centers which could provide environmental education.

There are three centers in Northern New Jersey, for example, which with the proper guidance and teaching materials could act as centers and put in motion program far more extensive and advanced than ours. We have visited with our children: Morristown Museum, Trailside Museum in Summit and the State Museum in Trenton. Very little in the way of environmental education appears available and yet the basic materials are there. There must be hundreds of such potential centers throughout the United States.

I urge you to pass the Environmental Quality Education Act of 1970 as swiftly as possible so that next year we can begin the long but critical job of re-education for survival on a national basis.

Exhibit No. 1

PROGRAMS SPONSORED BY CITIZENS FOR CONSERVATION—BERNARDS TOWNSHIP

"Environmental Brainstorming," all ages, 30–60 minutes, audience participation.

"Native Animals and Flowers," slide presentation, all ages, 15–45 minutes depending on age level.

"The Meaning of the Food Chain," discussion with visual aids, 15–30 minutes, all ages.

"What is Conservation?" experiments and games, 15 minutes, kindergarten to 5th grade.

"Restoring your Environment," 30 min., adult.

"Chalk Talk on Conservation," 45 minutes, all levels. (P)

"Life Cycle of the Gypsy Moth," 30–45 minutes, visual display including specimens; all ages.

"Environmental Education," 45 minutes. (P)

"County Parks are for People," How parks can play a role to preserve the quality of our environment. 45 minutes. (P)

"Random Reflections—Philosophy and Spirit of the Outdoors," 20 minutes, 6th grade and up. (P)

"Our National EQ" (environmental quality), 30 minutes, adult.

"The Passaic River and Its Problems," 30 minutes, adult.

"Population Problems," Alice Day, Smith College, 1 hour edited tape and discussions, adult and high school level.

"Environmental Crisis," Barry Commoner, 1 hour tape and discussion sessions, adult and high school level.

Speakers Bureau include: Mrs. Elfreda Finch, Mrs. Florence Cox, Mrs. Betty Little, Mrs. Ella Filippone, Mrs. K. Von der Heiden, and Mr. Walter Jones, Somerset County Naturalist.

Material for these programs was prepared with the assistance of Rutgers University College of Agriculture and Environmental Sciences, Somerset County Park Commission, N.J. Department of Agriculture, Somerset County Extension Service, North Jersey Conservation Foundation, and the National Wildlife Federation.

These programs are sponsored by Citizens for Conservation–Bernards Township. Arrangements for them may be made by writing to Box 232, Baking Ridge, New Jersey 07920 or by telephoning 766–5516.

(P) These programs may be arranged by calling Mr. Walter Jones directly at 766–2489.

Statement of Olga Madar

This statement is being presented on behalf of Olga M. Madar, Executive Board Member of the United Auto Workers Union, whose headquarters are located at 8000 East Jefferson, Detroit, Michigan.

We are happy for the opportunity to present our thoughts on H.R. 14753.

As stated in the findings and purpose of this Act, there is a great need to educate all citizens about environmental quality and ecological balance. We also have to educate them to the fact that we will not tolerate a contaminated environment any longer. The people understand that materials inside of a factory are the assets of that plant and when unused or unburned portions of these assets are put into the air or water, they still belong to that company and should not be taken care of at public expense.

Also, there is a great need to educate our elected and appointed officials who often add insult to injury by their public utterances and actions. For instance, when a Congressman says "if the people of this country are going to have their demands for power met, they are going to have to accommodate themselves to placing into the atmosphere the BTU's that you can't turn into electricity and they are going to *shut up* about ecological conditions."

People who contend pollution is inevitable are talking about money—not technology or ecology. Also, such remarks indicate that we must effectuate a change in our value systems. The Federal Government utilizes eminent domain to secure lands for projects in the public interest. What is more in the public interest than the air we breathe or the water we drink to sustain life?

Our hope now, as it always has been, is that effective action will be taken to sharpen the techniques and tools of education to make available educational opportunity to all, to allow Americans to share in shaping their destiny and determining the quality of their environment.

We feel the present acts dealing with the environment are designed to monitor and to produce an official acceptable level of pollution, not to stop it.

There are important decisions to make which will shape our future and these decisions cannot be made without all of the knowledge and facts correctly gathered and interpreted by not only those people who are decision makers but also by making sure that we involve the average citizen in effectuating the necessary changes leading to the solution of our natural resource problems.

As an example, in the view of this average citizen, union and non-union related, the major resources of the contemplated programs should be channelled into the central cities of urban areas, where the problems are most critical and environmental pollution the greatest. Union-affiliated blacks, other ethnic groups, and the deprived are trapped in the ghettos of cities where they have to accept as a way of life, the municipal and industrial pollution surrounding them. Their entrapment, especially our union members, is built not *so much on economic* deprivation but the subtle housing gentlemen agreements which severely limit their choice of housing and neighborhood.

As a natural consequence, they are most accutely aware of the impact on their lives, of the lack of understanding and knowledge about man's interdependence on man. Again, from their perspective there are natural resources and land use, peculiar to the urban environment, which can expand the purity and enjoyment of the environment by which they are daily confronted.

Therefore, under Section 2, Paragraph B, we would like the Act to specify labor unions as well as the others mentioned. Labor unions should also be included in Section 3, not only for the purpose of receiving grants, but also for developing the curriculums. We would like to see a project instituted in areas where people will participate, such as their church halls, neighborhood centers, local union buildings, etc.

Any program to improve man's awareness of his relationship to the total environment must be cognizant of this lack and be geared to positive programs and accomplishments in the areas where those who are deprived live and work.

The UAW in its policies, programs and activities has recognized historically that service to its members requires not only progress in the area of collective bargaining but also progress within the community to build a better life for all citizens. Our members and their families are directly affected by the environment around them, whether inside or outside the plant. The pollution of the air and of the water, the unwise waste of our natural resources are of concern to all of us.

Several years ago, in light of these needs, the International Executive Board, by unanimous action, approved the establishment of the UAW Department of Conservation and Resource Development, whose goals are to encourage, educate and mobilize our members, as responsible citizens, to take a more active role in our natural resource problems.

Funds should be allocated for programs and facilities, parks, schools, camps, work projects and training for park jobs. Above all, action programs should be instituted which involve youth and their parents in implementing the democratic legislative process, to stop the forces and change the practices which have made environmental pollution the critical problem of our day and the most glaring example of man's inhumanity to man.

To realize these goals, our Department has a staff throughout the country that devotes its full time to studying and programs at seminars, workshops, summer schools and leadership training institutes. The amendment to H.B. 14753, that we request would greatly expedite the realization of these goals.

MISSION AVENUE PARENT TEACHER ASSOCIATION,
Carmichael, Calif., February 10, 1970.

Hon. CARL D. PERKINS,
Chairman, House Committee on Education and Labor,
House Office Building, Washington, D.C.

DEAR MR. PERKINS: The following resolution in support of the Environmental Quality Education Act (H.R. 14753) was adopted at the February 10, 1970, unit meeting of the Mission Avenue Parent Teacher Association.

Whereas the California Education Code requires instruction about man in relation to his human and natural environment.

Whereas the Mission Avenue Parent Teacher Association has a representative working at the school and district level to implement this.

Whereas this assembly recognizes the need for assistance in developing new and improved curricula, pilot projects, teacher training and community education designed to enhance environmental quality and the maintenance of ecological balance.

Therefore, we wish this resolution be included in the records of hearings as in support of authorization and funding for the Environmental Quality Education Act (H.R. 14753).

Mrs. Ralph Palumbo,
President.

Missouri Botanical Garden,
St. Louis, Mo., April 13, 1970.

Representative John Brademas,
Chairman, Select Subcommittee on Education,
U.S. House of Representatives, Washington, D.C.

Dear Mr. Brademas: I am pleased at the opportunity to offer written testimony concerning the "Environmental Quality Education Act" H.R. 14753. I agree completely with the "statement of findings and purpose" of the Bill. I agree with the suggested "use of funds" as outlined in the Bill. May I make a few statements to support your efforts for better education of the public concerning environmental matters.

Environmental problems will continue to plague modern man for a very long time in the future. Even if we take fairly massive measures soon environmental problems are likely to continue to accumulate, to become more complex, and to be more difficult of solution. The growth of human population, which will continue for many decades even if we reduce the rate of growth now, will continue to magnify the problem of waste, of pesticides, of herbicides, of air pollutants and possible climate change. The sociological problems of the environment will continue to become more acute. Furthermore, the ecological complexities which may arise are likely to be far more difficult to correct than anything we have seen to date.

Let me take a moment to place into the record here an editorial on this matter which I have written for publication in the *Bulletin* of the Missouri Botanical Garden, May 1970 issue.

ECOLOGY VERSUS ENVIRONMENT

The people of America suddenly are coming to the realization that they have fouled their own nest. Man, the dirtiest of all animals, knows now that the spaceship Earth has limited resources, limited space, and a fragile green surface upon which he is completely dependent.

Ecology has suddenly become the "in" word. However, the public is using the words ecology and environment interchangeably and often without distinction. Ecology is the study of the relationships between organisms (plants and animals) and their environment. The science of ecology began about 1900 but the word itself was used by Darwin, Haeckel, and others earlier in the nineteenth century. By the end of the first decade of this century there were many ecologists in America who were teaching and doing research in ecology, including my father. The Ecological Society of America was established in 1915 and today has a membership of 3500 professionals.

We live in the environmental theatre and the play includes the ecological scene, the geological scene, the geophysical scene, the sociological scene, the economic scene, and others. Ecology is just one body of knowledge among many that concerns the world in which we live; e.g. the interaction of plants and animals with their environment, with one another, and including the influence of man. If your concern is with pollution then your concern if the the quality of the environment. If your concern is with the effects of pollutants on plants or animals, then your interest is ecological. If you are studying how pollutants affect man, than your concern is with human health. Meteorologists study the weather, an extremely important component of our environment. A meteorologist is not an ecologist unless his objective is to understand the effect of weather on plants and animals.

The field of ecology is a very distinguished profession with a substantial history of demonstrated success including the application of ecological principles to wildlife management, land use, forestry, agriculture, and other fields. Many of the immediate problems faced by man are environmental. Pollution is a prime example. However, the ultimate confrontation between man and Earth's eco-systems is ecological; for man must learn to live in close cooperation with the plants and animals of this planet.

It is extremely important to educate the general public concerning environmental problems. We should develop in the minds of all citizens an absolute sense of responsibility towards the conservation of wild life, resources, energy, and the products we use. The public must understand the wisdom of recycling everything in society. The public must appreciate that the careless use of electric power, whether by burning too many lights, by allowing the television to remain on when they have left the room, or by careless use of air conditioning, places an immediate demand on the electric power generating plant and hence by so doing creates more pollution of the atmosphere. The public must learn to throw away as little as possible and to reuse everything as often as possible including paper materials. We must reduce the amount of waste per person in our society.

The ecological aspect of life on the planet Earth involves the delicate balance between living things, plants and animals, and the environment. Man is rapidly eliminating natural systems, eradicating species, and in various ways upsetting the delicate balance of the life support system of this planet. Many of us believe that man will always need nature; that man will always need in various ways all the living products of evolution. It is difficult for the vast majority of our citizens who have spent their entire lives within our urban areas to realize how precarious is the balance of nature and how dependent upon it modern man really is. The more industrialized we become and the more manicured our landscape becomes with agriculture the more isolated is modern man from natural history. Yet man needs nature to keep the life support system of the planet Earth in operation (including the production of oxygen), to keep wilderness areas as open space and to maintain the gene pool of rare species, to have space for recreation and hunting, and to have the diversity of life so necessary to man's sanity.

It is my opinion that every school child in America should have several courses during his elementary, secondary, and high school education in matters of natural history, evolution, and ecology. Such courses could be extended to include reasons for the control of human populations and in matters pertaining to environmental management. It is of particular import that we educate all future citizens concerning these matters so that they assume the responsibilities of society with an acute awareness of the difficulties faced by mankind and of the necessity to use all the rationale possible for the wise management of the Earth ecosystem. The very survival of man as a healthy, sane, stable well being depends on modern man having an understanding of natural history and containing within himself a strong ecological conscience.

Sincerely,

DAVID M. GATES,
Director.

STATEMENT BY JOSEPH A. RUEFF, COORDINATOR, SOCIAL SCIENCE RESEARCH PROJECTS, ELKHART COMMUNITY SCHOOLS, ELKHART, IND.

THOUGHTS ON A POSSIBLE TRANSFORMATION

What has happened to this place?
What has transfigured this, my home?
What has changed the mountain's face
And stopped the bear's wide, rambling roam?
What has changed this place of mine?
What has made it bleak and dreary?
How could this have happened in such short time?
Now my eyes are fogged and bleary. * * *
The lake, the lake how great you were.
You floated boats on your water's wings.
But now your wonders are blanketed by black
And now your beauty is one of those forgotten things.
The bay, the bay! Are you too gone,
Where I used to play?
The sand almost gone, the steps washed away,
The murky water—cold and gray.

All gone, all gone, this place, this place.
I see tears fall down your roughened face,
But no man's work can now replace
The beauty you once held.
I must go now, and leave you!
Oh, how I do bereave you!
Gone forever, gone for good—
Because man did not as he should.
—Linda Drennan, Senior Elkhart High School.

The above poem by Miss Drennan expresses so eloquently what is on the mind of nearly every student in our country, from the primary grades to post-graduate level. For national publicity regarding environmental problems has superseded Viet Nam, civil rights and other problems as the number one social issue of the day. Yet this plethora of information, misinformation, and emotional outcries can lead students and adults alike to despair and confusion. We can see ourselves as victims of physical and social forces beyond our control. This feeling, if it would become the prevalent attitude, could be equally as dangerous to the future of this nation as are the problems facing the environment itself.

On the other hand, there are many who belong to a kind of "problem of the month club." As the ominous environmental statistics lose their initial impact, these people will turn their attentions to other problems.

Current attitudes and outlooks clearly will not lead toward the environmental improvements we so desperately need. If we are going to meet the challenge we must create new perspectives. We must be able to weigh the consequences of alternative actions by individuals, by the private sector and by the public sector of our society. We must reorder our sets of values. As Norman Cousins said so well recently in the *Saturday Review*:

"Philosophy precedes ecology. What is needed today are new realizations about man's place in the universe, a new sense of life, a new pride in the importance of being human, a new anticipation of the enlarged potentialities of mind, a new joyousness in the possibilities for human unity, and a new determination to keep this planet from becoming uninhabitable."

Clearly this cannot be accomplished by a few crash courses in environmental problems. It calls for the establishment of long term goals, and, without our educational system, it calls for major changes that will encourage the attainment of those objectives. It is imperative that Federal aid be available to encourage these changes. It is clear that when state and local tax structures have difficulty meeting the needs of current programs, one cannot expect much revenue to be available for innovation.

What kinds of goals should our educational system establish? First of all, it should strive to make students aware. By awareness I do not mean that they must become more aware of individual environmental problems. Schools already are teaching much about pollution, conservation, and the plight of the inner cities. Rather I mean that they must become more aware of man's relationship to his total environment. They must see that specific environmental problems are interrelated and that a delicate balance exists between the forces of nature.

Secondly, it should lead students to become concerned. Such concern, to be effective, must transcend the individual and become a concern for the environment as a totality. The development of "the universal man" must become a dominent objective in any program for environmental quality education.

Third, schools must strive to develop student competence in the handling of environmental problems. In recent years many school systems have initiated curriculum reforms which incorporate analytical problem solving techniques. These are the capstones of the new mathematics, the new science and the new social studies. But these approaches are not enough. In fact, they can even compound our problems, because they are borne from a philosophy which has been responsible for many of our present conditions.

For one hundred and fifty years this country grew and prospered because of a narrow pragmatism that allowed us to focus directly upon a specific problem and set about to solve it. When a nation was to be spanned we built the transcontinental railroad; when we wished to fly we invented the airplane. As a result we have developed a blurred periferal vision. That is why many see pollution, blighted cities or the plight of the redwoods as distinctly separate problems. That is why many fail to consider the broad consequences of actions undertaken to solve narrow problems.

What then, can be the role of the federal government to encourage environmental quality education? While there is much that needs to be done at all levels of education I should like to limit my remarks to those areas with which I am most familiar, public school education from kindergarten through grade twelve.

1. *Funds should be available for curriculum innovation.*—Such a program could be developed that would be similar to Title III, ESEA. I would suggest the following criteria:

(*a*) Such innovation should involve restructuring the entire curriculum from kindergarten through grade twelve so that the objectives mentioned above can be attained. This implies a marriage between the natural and social sciences. It implies sequential development from the primary grades through high school not only of these sciences but also the humanities.

(*b*) Such development should involve teams composed of educators and specialists from public schools, colleges and universities. These specialists would represent all of the fields necessary to develop a viable program. The list could include natural scientists, social scientists, philosophers, artists, writers, and others whose contributions would be deemed imperative. Many curriculum projects now under way have a start in this direction. For example, ten years ago, Prof. Lawrence Senesh, then of Purdue University and now at Colorado University, began working with Elkhart teachers in the field of economic education. From this modest beginning Prof. Senesh has developed what has become a multi-disciplinary social science program. Social scientists literally from around the world have added their expertise. As the project widens further to include environmental education more and more specialists outside the social sciences are being called upon. Only in this manner can we insure intellectual honesty. Only in this way can we help students develop the breadth to understand all of the aspects of environmental problems.

2. *Funds should be available to utilize the community as an environmental laboratory.*—To try to help students become aware, concerned and competent in the handling of environmental problems, to try to help them develop a philosophy that will promote environmental harmony is impossible within the confines of a traditional classroom. Students must become involved. They must get into their cities and out to their countrysides. Yet, our schools are equipped neither institutionally nor financially to provide such essential activity. The federal government can provide aid for transportation, for cataloging resources, and for whatever increased supervision is necessary.

3. *Funds should be available for materials development.*—If an impact in environmental education is to be made on a national basis one cannot rely only upon local curriculum innovation to provide the answer. Materials of all kinds need to be published. Yet, one cannot expect commercial publishers to do the job. The market restricts most to be trend followers, not trend setters. Consequently the federal government should provide grants to encourage materials development, as it has in recent years for specific subject areas. The major criterion should be that the materials be broadly based and encourage the attainment of the objectives outlined above.

4. *Funds should be available for in-service education.*—Probably the greatest obstacle to the success of environmental quality education is the teachers themselves. For they are creatures of the systems that have created our present problems. They are victims of specialization. For many elementary level teachers skills development in the traditional readin', writin', and 'rithmatic still has top priority. It is difficult for them to look upon these skills as tools for communicating ideas, for developing a philosphy, for helping children develop a feeling of unity with the rest of the world.

The secondary teacher has been confined to his subject area specialty. Often he knows little about other curricular areas. Without help it would be difficult indeed for him to adapt to a broadly based program.

These, then, are my suggestions for developing programs that, hopefully, will lead to an improvement in our environment. The task for such broad curriculum changes is not easy; the rigidity of our present educational framework will be difficult to overcome. But I can foresee one thing:

Without federal guidence and financial aid, the task is impossible. And if we cannot take positive steps to improve this one aspect of our environment, our educational system, what hope is there that we can achieve success in other aspects?

CONSERVATION TEACHING IN THE CITY

(By Gerald Schneider, Program Specialist, for the Girl Scouts, U.S.A.)

Our Nation and our State was once a wilderness. People were few in number. Streams were clear and the air was fresh.

Times have changed. There are hordes of people today—around 200 million in the United States alone. The Nation has become a tangle of huge cities, great industries, sprawling suburbs, linking highways, dwindling farmlands and wilderness remnants. Rivers are too dirty to drink from or swim in. Smog plagues many communities. Streets, roads and recreation areas are unsightly because of litter carelessly tossed away.

THE "PERILOUS P'S"

In short, much of the country's natural beauty and richness is gone. What natural loveliness and wealth remains is threatened by the "perilous p's": *Population, pollution, poor planning and poverty.*

Never before has the need for conservation action to improve, restore and protect the resources of the physical environment been so urgent. Never before has the need for a conservation conscious public been so necessary. *Especially critical is the need for effective conservation education in the city.*

Most people live in cities (about 70 per cent of Americans do and that figure increases daily). With the one man, one-vote rule becoming the political order of the day, people in the cities will soon determine just about all land-use policies. This means that *regardless of how successful our conservation efforts are with farmers and rural people, conservation efforts will be largely futile in the not-so-long run without understanding support from urbanites.*

For the most part, trying to teach conservation to adults has been a failure. Our hope—our destiny—lies in the hands and hearts of our youths, notably, our urban youths. Since about half our population is under 25 years of age (and grows younger), we may still be optimistic about tomorrow if we convince young people of the significance of conservation messages *today.*

Inability of many conservationists to effectively communicate with city children (and adults) has probably resulted more from lack of empathy than lack of reason. Most conservationists live and work in rural areas and like it. They are to a great extent consciously or subconsciously alienated by cities.

This "rural bias" is often picked up quickly by city children and, never having been exposed to such an orientation, they are turned off by it and drop out before education begins. First things first. City youths need conservation "feet" before they are ready for conservation "shoes."

Children (and adults) *like* the city despite problems of smog, crowding and traffic, or so they say. Conditioned by their concrete environment, they live like modern cliff dwellers and feel little need for open spaces, or so they think. Blaring radios, television, pop art and "happenings" are preferred to woodland solitude, scenic beauty and nature study in many cases, as far as they know.

Like it or not, that's the way urbanites are in general (don't be fooled by their week end treks via automobiles to outdoor amusements). While there are many exceptions to any generality, the author believes that the urban point of view *must* be accepted by conservationists who want to succeed in their conservation education efforts in cities.

GENERAL TEACHING PRINCIPLES

How do you teach the urban child? *You start where he is* and lead him forward step by step when he is ready for advancement. Forget "preaching" and accept him as he is. He may believe his way is right, too, until shown.

FOCUS ON PROBLEMS

A practical approach to teaching older youths, ages 12 and up, is to focus their attention on problems of city planning, waste disposal, water supply, pollution, ghettos and parks—things that affect their immediate, everyday lives. Save the forest management, soil erosion, hydrological cycle and species identification business for later unless they ask about these things. Don't risk losing them before you begin; there are few chances available to reach them and no time should be wasted.

For younger children, ages 3 to 11, contact with live plants and animals can be most meaningful. Consider starting with the handling of bunnies and chicks since city children are often afraid of unfamiliar wild animals (and dogs). A simple introduction to the ecology of a vacant lot, patch of ground, sidewalk crack or a city tree is good. Stress the *fun, excitement* and *adventure* of exploration outside the classroom. Leave the more structured science learnings and memorization for later years—especially with the very young.

And don't feel guilty when the kids are having fun outdoors and aren't being formally instructed. They are probably learning a great deal on their own and, best of all, discovering that the outdoors has *value.*

Contact with the out-of-doors outside the city is important for all age groups. Urban children need outdoor experiences in the country to contrast to their city lives and values. *Love* of out of doors (or any other thing) probably results from actual favorable experiences and can't be taught from a textbook or by osmosis.

City kids should have many opportunities to camp, hike, cycle, picnic, swim and go boating in the out-of-doors. Teach safety, first aid and outdoor manners when necessary because it's necessary. But don't ruin the fun of "first experiences" by burdensome emphasis too soon on outdoor skill development. Learning to tie knots is not often important the first time out. Vigorous adherence to adult-made time schedules is also unwise. As little as possible should be done to restrict unbridled enjoyment of the out of doors.

Reinforcement of love of the out of doors and the development of conservation values comes from *involvement in conservation action projects.* Even as simple a beautification project as planting flower seeds and tending them in a flower box hung from a window may leave a child with a favorable lasting impression that no conservation lecture (such as is this article) can duplicate. While such projects may seem superficial and lack continuity, projects like these are the stuff on which children build their character.

Too many times, adults concerned with the problems of the world and the big issues of the day forget that little things mean a lot to a child.

THE KEY TO SUCCESS

Incidentally, the key to success in conservation projects involving youths is to let the youths do as much as possible of the planning, operation and follow-up for the projects. It is a common mistake to give young people unimaginative adult-planned work projects and use them as a cheap source of labor for dull manual work that adults won't do on their own or hire help to do. Adults working with children should *ask* pointed questions, answer questions asked of them, give technical assistance, "open doors" to resources and join in like everyone else on work assignments. But the kids should be the bosses—they should make the major decisions and assume the major responsibilities on projects.

When working with children new to conservation, consideration should be given to avoiding use of the term "conservation" altogether. It is a confusing term that conjures up different images to different people, leads to arguments about its definition and can be omitted when teaching youths. Direct discussion of environmental problems such as pollution and poor planning without an overall label for the concerns included is possible. After some contact with study or action on environmental problems, youths can be exposed to the complexities of the term "conservation."

ECOLOGICAL SPECULATION

The rationale for much of what we call conservation can be made apparent to older children by ecological speculation. A favorite activity of the author is to join youths in speculating about life on earth as in a more or less closed system in which we may live or die on our decisions to alter the environment. The problem might be posed in the following way:

"Suppose you woke up one morning and found yourself in an unbreakable glass room, completely sealed off from the rest of the world. There is a fair amount of air in your glass prison and sunlight streams through the transparent walls at one end. A huge tank of water on the floor contains plant-eating fish of both sexes and edible green algae. Otherwise, the room is empty. Could you survive?"

Yes, in theory, if you manage resources wisely (conservation implications) and don't contract any diseases. The discussion might follow along these lines:

"Air can be cleansed of the carbon dioxide produced in breathing, by the green algae, which can also renew the oxygen. Excess fish and algae become meals, supplying protein, vitamin, mineral and other nutritional needs. But how much algae and fish can be safely eaten at any one time without endangering reproductive ability of the organisms involved and fatally depleting the food supply or reducing oxygen renewal potential? Proper management and harvest of algae and fish based on some research (conservation implications) is important.

"Body and other wastes can be used as fertilizer to grow algae and, thereby, fish. Such use also solves waste disposal problems. Too much fertilizer at any one time may not be absorbed by the water and could cause pollution and death of fish and algae, (therefore, conservation implications). Waste disposal requires management based on research just as fish and algae management does (conservation implications).

"Water, heated by the sun, evaporates from the tank and condenses on the inside glass walls. The precipitated water is used for drinking and bathing. Life can go on."

Reads like a science-fiction story a little, but it isn't. Like the glass room, the Earth is a closed system. Earth's inhabitants, rocks, oceans and air are held together by gravity and more or less isolated from the rest of the universe. Except for some cosmic dust and meteors, almost no matter enters. And conversely, no matter escapes, except for a few space vehicles and some molecules of atmospheric gas.

Sunlight provides the energy to recycle everything and the water (hydrological) cycle and food production on Earth operate on the same principles found in the glass room. As in the glass room, how environmental resources of Earth are managed is important.

There's only a certain amount of useable oxygen in the air (about 20 percent of the atmosphere). Can we safely continue to load it with tons of pollutants? Can plants cleanse the air of manmade chemicals and wastes they never encountered before in their evolution? How much plant cover do we need to renew our oxygen supply? Is there a danger that too much plant cover is being removed in the development of cities and highways?

And what about clean water? How much waste and debris can rivers, lakes and oceans assimilate and still support life?

Our dependence on the environment forces us to consider what we can do to maintain critical environmental resources or risk the consequences of relying on chance or future solutions. Faced with such a choice, after speculating on the possibilities, the author has found that urban youths are usually rational enough to choose *donig something now* rather than waiting for a future solution which, even if it comes may come late.

Stress on ecological speculation here is on bare survival because *everyone* should be able to understand or sympathize with the need for conservation to guarantee survival. After an initial introduction, *and when they are receptive to it*, urban youths might want to speculate on the esthetic, psychological and spiritual environmental resources. They may want to probe the mixture of philosophies attributed to or associated by at least some people with conservation: "Reverence for life" concepts, natural beauty, wilderness "tonic" and such.

But try to discuss outdoor sentiments and esthetics before they've been exposed to survival concepts or had meaningful outdoor experiences and you may lose their interest. They may even laugh at you.

(*Note*: The term "conservation" was mentioned in parenthesis only in the ecological speculation discussion in this section and it was put there just for the reader's reference.)

PLANTS AND ANIMALS

As H. Wayne Trimm's illustrations in this centerspread show, many kinds of plants and animals are found in cities—even in as big a place as New York City. These forms of life are valuable teaching resources that can be used to advantage.

What kinds of plants and animals are found around a school, a neighborhood or on a single street? How do plants and animals survive in the concrete jungles of cities? Can we learn anything of importance from these organisms that we can relate to our own survival? Do plants and animals contribute to the interest and charm of a community?

Discovering the answers to questions like these may generate greater awareness of the concept of *environment*. It may open up a whole new world for a child to explore between his school and the television set.

Going a step further, children can take local plant and animal censuses. A simple survey for the very young might be a count of the number of London plane trees near a school or the number of sparrows and pigeons in a five-block area. Older youth can use fairly sophisticated sampling techniques to estimate the population of particular species in the total community. Such activities expend awareness of the environment and form the foundation on which many conservation *attitudes* can be developed.

Reinforcement of certain conservation values results from projects to improve the living conditions for plants and animals in the city. Shrubs can be planted near homes, around schools and in parks (with permission). Shrubs are not only attractive in themselves, but they provide cover for wildlife and, when properly selected, summer and winter animal food. Trees give shade, seclusion, beauty and wind protection and become nesting sites for birds and other animals—so, plant them. Flowers, such as sunflowers, produce seeds that children and birds enjoy—therefore, plant them. The affection of a young child for a shrub, tree, or flower *he* helped to plant is a wondrous sight.

The three basic needs of animals are food, water and shelter close enough for animals to get at. Food and shelter can be provided by the plantings mentioned above. Animal feeding stations can also be provided and kept stocked with suitable foods. Bluebird houses and other birdhouses can be built out of large tin cans, tar paper, nail kegs and wood scraps and put in place. Homemade bird baths become water sources in summer (keep them filled with warm water only in winter or let them stay dry; birds can obtain water from snow and ice). To a child especially, action speaks louder than words.

THE BOOKS ARE GLIB

While plantings and animal habitat improvement projects aren't difficult, books are often too glib in describing such projects. The author doesn't want to join them in their guilt. No two situations are exactly alike and, while you can use the above as a general guide for improvement projects, it's best to have professional advice on projects from experts on the scene—park department officials, landscape architects, conservation agency employees, science teachers, professional gardeners and others.

COMMUNITY PLANNING BY YOUTHS

Cities are rich sources of ideas for community planning. Environmental resources are stretched to the limit by the impact of thousands of people concentrated in urban living areas. Problems of noise, air pollution, water supply, slums, crowding, traffic, sanitation, space and appearance plague cities. Solutions are difficult. However community planning on a youth-sized level can foster conservation values.

How about having kids make a conservation survey of their neighborhoods? Research should precede action to insure effectiveness. Are there garbage-strewn vacant lots that can be used and are needed as vest-pocket parks, tot-lots, and such? Is there a need for shade trees by schools, in parking lots and along streets? What can young people do, if anything, to make improvements?

Children can make a photographic survey that they can share with others and aid them in analysing neighborhood needs. Using even the cheapest cameras, youths can go around their neighborhoods and take pictures of the things *they think* make the neighborhoods attractive and the things that they think are ugly. An exhibit of contrasts can be created from the collection of pictures taken. The exhibit can be discussed and followed up by environmental improvement projects when possible and appropriate. What a valuable conservation teaching resource the collection of pictures make!

Surveys and community planning analysis are "in" subjects that should appeal to urban youths.

Air pollution surveys need not be complicated. Children can study air pollution by use of their senses. Does the air have a funny odor in some parts of neighborhoods (a smell index of pollution might be developed?) Does dirt rub off bricks and stones of buildings at a touch (a touch index)? How often do windows at home need cleaning, or where can smoke be seen (visual indices). Simple, but these measurements are fine for the young.

A DIRTY AIR INDEX

Children can smear sheets of acetate or bond paper with petroleum jelly and place the sheets in open areas such as on window sills. How dirty do the sheets get over a period of time (use magnifying glasses and microscopes to help look at them)? Compare the dirty sheets to clean sheets and a dirty air index may be created.

One-gallon, wide-mouthed jars filled with a pint of water and left open and exposed become traps for air pollutants. How dirty does the water get in a day, week or month? Boil off the water and the remaining solid materials can be examined. And another air pollution index can be made.

What can you find in the filter of an air conditioner? Do children or should children worry about breathing in the things they find trapped in filters? What are the local air pollution control regulations in the community, if any? Is enforcement of any laws good (make sure that this is researched before comment is made)? What can children do about air pollution? Discuss these questions with the youths of cities.

Where does the community's drinking water come from? Can the children take a hike to any of the water sources? Is there enough water for everyone and for every use? Has vegetation been affected by lack of water or too much water? Do local waterways smell, show visible amounts of garbage, seem choked with algae and debris, look muddy or unattractive to swim in?

Does the community treat its sewage? Is a visit to a sewage treatment plant possible? Is there primary, secondary and tertiary treatment of sewage, if any? Can young people help improve things?

Noise! It may be killing us by degrees and affecting our hearing. How noisy is the neighborhood? Kids can find out for themselves. Their ears may not tell them because they've conditioned themselves to hearing only certain sounds important to them and screening out others. Are there reasons why selective hearing may be important to the psychological health of city dwellers?

Tape recorders won't discriminate among audible sounds. Noises heard in different parts of a neighborhood can be recorded on a tape recorder. Children can listen to the finished tapes. If they are surprised at the actual amount of noise there really is, why not discuss it? Can a noise index for the neighborhood be developed? (*Note:* Some noises on recording tapes are natural and allowance for static should be made.)

CURRENT EVENTS AND HISTORY

Today's newspapers are filled with articles having conservation implications. Examples include hunger at home and abroad in overpopulated countries, flood damage to homes built in flood plains, highways cutting across the last open spaces in a community, rising danger of respiratory diseases caused by air pollution, lack of recreation facilities in the inner-city and hot summers, houses sinking into filled swamplands, medical effects of crowding, the search for status and identity in a crowded world, controversies over the establishment of a redwoods park and more. All these current events should appeal to youths and are naturals for civics, social studies, sociology, geography, science and other courses.

Debates on the real issues behind conservation controversies—the kind that rarely get into conservation publications—can appeal to urban youths not otherwise sensitive to conservation concerns. With the frontier gone, rural land being swallowed up by urbanization, the value of rugged individualism undergoing scrutiny, an apparently rising welfare state, an increase in crime, violence and demonstrations in the streets and on college campuses, our entire socio-economic political life is being tested and questioned. We are forced to re-evaluate basic issues affecting conservation:

With people so many and resources so endangered, should persons still have the right to be careless with property or do what they like with the land they own? Should people be allowed to build homes in flood plains and other unfavorable sites (ecologically unfavorable)? Should people be allowed to settle in places like Arizona where water problems are great and expect the rest of us to subsidize their water needs?

Should public money be given to private businesses to stimulate installation of air and water pollution control equipment in factories? Should restrictions be placed on visits to public parks and recreation areas? Should regional planning replace local autonomy on zoning regulations?

Also, consider the following: Does the concept of the greatest good for the greatest number, often associated with conservation, overlook minority interests? Does *The Conservation Pledge* so often used ("I give my pledge as an American to save and faithfully to defend from waste the natural resources of my country—its soil and minerals, its forests, waters and wildlife") need to be updated to take into account the *total* environment with such specifics as slum housing prevention, beautiful cities and others?

Questions, questions, questions! They all need to be asked and answered if we are to prepare for *tomorrow's* conservation problems. And, with freedom of discussion, urban youths can be turned on by these subjects.

History and resource use and conservation are closely linked. What role did beavers have in winning the West? Were resources the basis of the Industrial Revolution? How did the Homestead Act and land give-aways to railroads affect land-use policies in the United States? Why did such widespread poverty eventually come to Appalachia? These are but a few of the many conservation-linked history questions that can be explored.

Going back further in time, there may be interest in studying whether or not the downfall of the Roman and other empires was due to resource abuse. W. C. Lowdermilk's pamphlet, "Conquest of the Land Through 7,000 Years," available free from the U.S. Department of Agriculture, makes interesting reading on this matter.

CONCLUSION

This article only begins to investigate the opportunities for meaningful conservation teaching in the city. It is the result of successful conservation teaching in the city and much introspection and observation by the author who grew up in a slum area of Brooklyn. At least some of what the author has written is controversial and should cause some eyebrows to be raised. Certainly, the article should not be considered a final statement on the philosophy of teaching conservation to urban children.

Technique and approach to teaching in the city was emphasized for a Machiavellian reason: It works! The author did not want to suggest that traditional conservation teaching, study of the management of minerals, oils, forests, water and such, wasn't important to the urban child. But you don't communicate with anyone unless you *start where he is and build step by step* until he's ready for new ideas and concepts. Truth is what people want to believe, not necessarily fact.

Once a city child is aware of environment, has reflected on city environmental problems, has worked on interesting conservation projects, has had opportunities for fun and adventure in the out of doors, he may be ready for more traditional conservation teachings. Until such time, the city child must be met on his own ground.

SAN FRANCISCO STATE COLLEGE,
Kensington, Calif., March 28, 1970.

Congressman JOHN BRADEMAS,
Chairman, Select Subcommittee on Education,
Committee on Education and Labor,
Washington, D.C.

DEAR CONGRESSMAN BRADEMAS: As your sub-committee begins hearings on H.R. 14753 the Environmental Quality Education Act I should like very much to share my views on this most important legislation for insertion in your printed hearings.

It is difficult to find in American history any parallel to the sudden explosive popularity of the environment.

The marathon dancing, goldfish gulping and flagpole sitting of the Depression years are in some ways comparable as popular preoccupations, and if it is objected that these manias were absurd, it is also possible to find disconcerting elements of the absurd in the current craze for ecology.

At the recent UNESCO environment conference in San Francisco there was audible off-stage worries about the dangers of "overexposure." The graveyears of contemporary history are littered with fads that flared by night and were promptly forgotten by the fickle public, from Dianetics to McLuhanism.

In coming weeks, the battle will be stepped up across the country. For instance, the U.S. Student Press association will devote its annual college editors conference to ecology and environment.

The University of Michigan several weeks ago held the nation's first teach-in on the environment. The goal as stated by the teach-in's prospectus, "Is action-prompt, priority action-to turn back the tide of environmental destruction and needless population growth that threatens the survival of our species."

At the University of Washington, some 200 students planted 300 saplings in a swampy garbage dump just off campus.

At Wisconsin, members of the Science Students Union staged a march on the state capitol to protest the continued use of DDT.

At Champagne-Urbana, 150 University of Illinois students picked up 60 tons of garbage from a creek flowing through the campus.

In Boston, a group of local residents and students from Harvard University, Massachusetts Institute of Technology and Brandeis University marched on the statehouse to demand stricter air pollution controls.

At UCLA, about 100 students demonstrating against DDT and air pollution blocked recruiters from the Olin Corp., Monsanto Co. and Ford Motor Co. for holding job interviews on campus.

"We're just starting to get into this," explains a junior coed at the University of Minnesota, where students staged a mock burial of a gasoline engine. "We're objecting to the deterioration of our land. Just look around—the air, the water, the roadsides, everything stinks."

Many schools have formalized student concern about ecology by establishing the study of environment as a part of the curriculum. The University of Illinois, for example, created a new course (General Engineering 293) to study pollution in the campus creek at the same time the students cleaned it up.

At Louisiana State University, the engineering department has just begun a new survey course dealing strictly with the problems of conservation and pollution. And Michigan State officials have announced plans for a new Center for Environmental Quality.

In his State of the Union message, President Nixon said the "restoring nature to its natural state is a cause beyond party and beyond factions. It has become a common cause of all the people of this country".

Yours Most Sincerely,

CLAUDE M. URY.